Comune di Grazzanise

Provincia di Caserta

PIANO URBANISTICO COMUNALE

(Ai sensi della L.R. Campania 22.12.2004 n° 16)

Integrazioni Luglio 2023

ALL. N° 2

INDAGINI ATTUALI: H.V.S.R.

Il geologo
Dott.ssa Candida Salato

Firmato digitalmente da
Candida Salato
SerialNumber = TINIT-SLTCDD66R61E158I
C = IT

U.O.D. GENIO CIVILE DI CASERTA
Parere ex art.89 D.P.R. 380/01 e art.15 L.R. 9/83
Rilasciato con D.D. n. 227 del 02/11/2023
Elaborato n. 59 di 62
Il Responsabile del Procedimento
F.to digitalmente Geol. Vincenzo Siviero

Firmato digitalmente da
Antonio D'Errico
C = IT

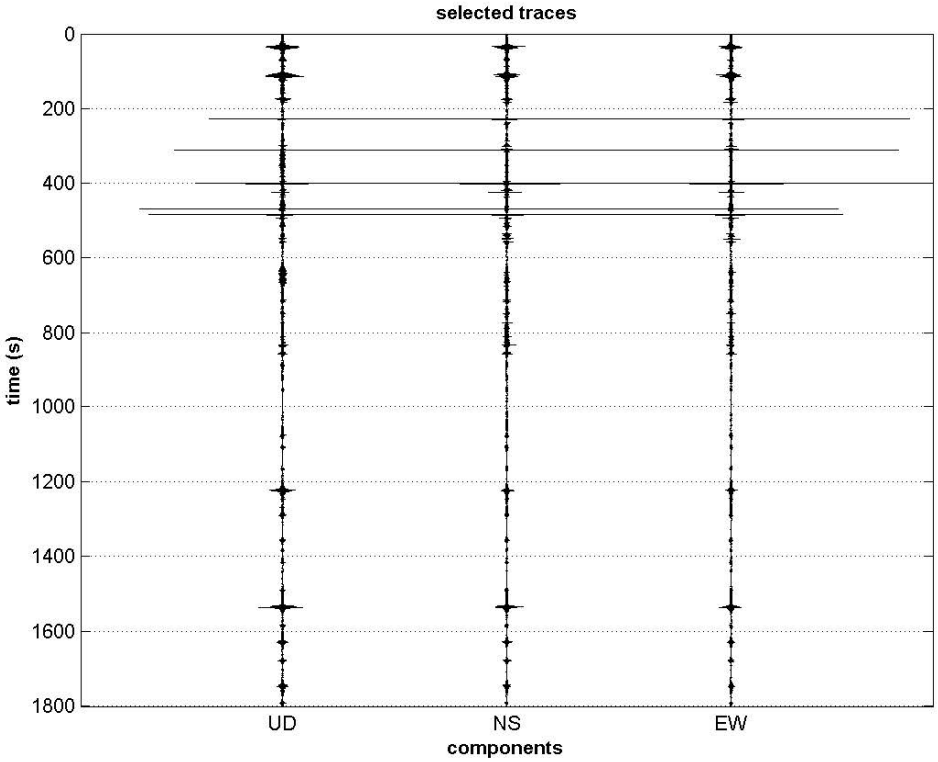
Data: 07/2023

HV-1

Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRA-1.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 29.2
Tapering (%): 10
==========

In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 1.1
Peak HVSR value: 2.1
Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 1.1 > 0.5 (OK)
#2. [nc > 200]: 3718 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)
Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: yes, at frequency 2.7Hz (OK)
#3. [A0 > 2]: 2.1 > 2 (OK)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 5.001 > 0.107 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.273 < 1.78 (OK)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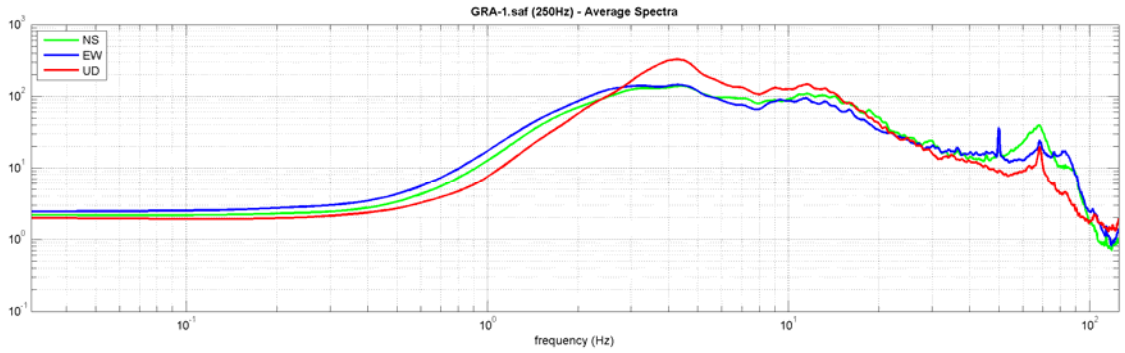
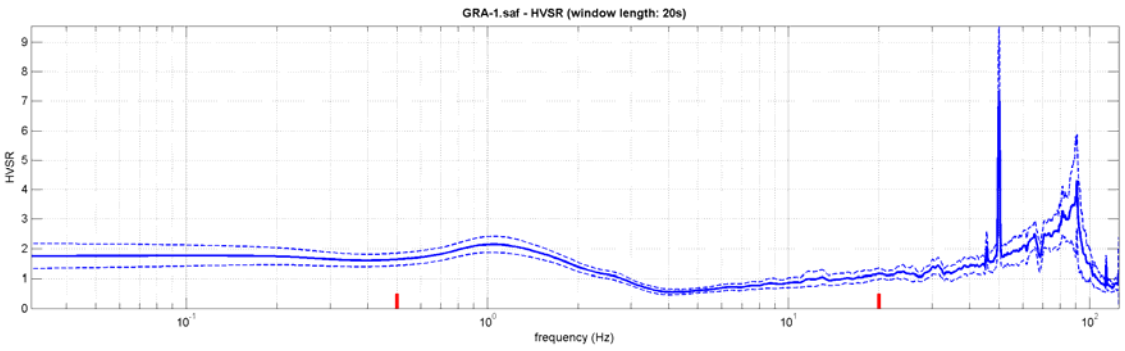
EW
components


GRA-1.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)

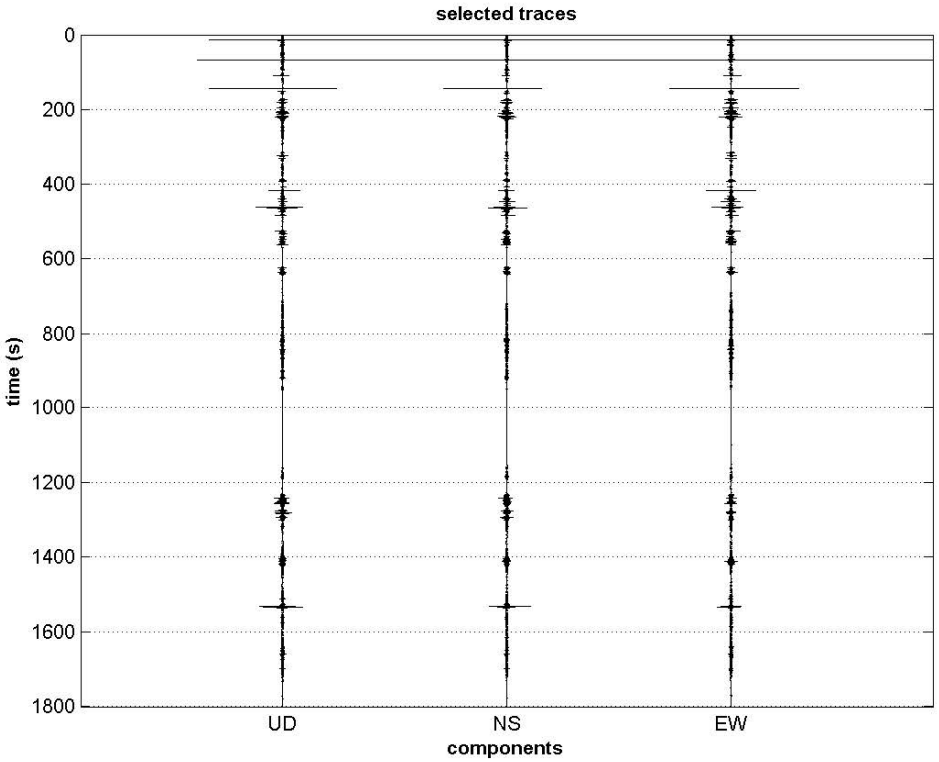

GRA-1.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

HV-2

Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRA-2CLEAN.SAF
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 29.5
Tapering (%): 10
==========

In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 1.0
Peak HVSR value: 2.4
Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 1.0 > 0.5 (OK)
#2. [nc > 200]: 3546 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)
Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: yes, at frequency 3.7Hz (OK)
#3. [A0 > 2]: 2.4 > 2 (OK)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (NO)
#5. [sigmaf < epsilon(f0)]: 6.842 > 0.101 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.276 < 1.78 (OK)


selected traces
time (s)
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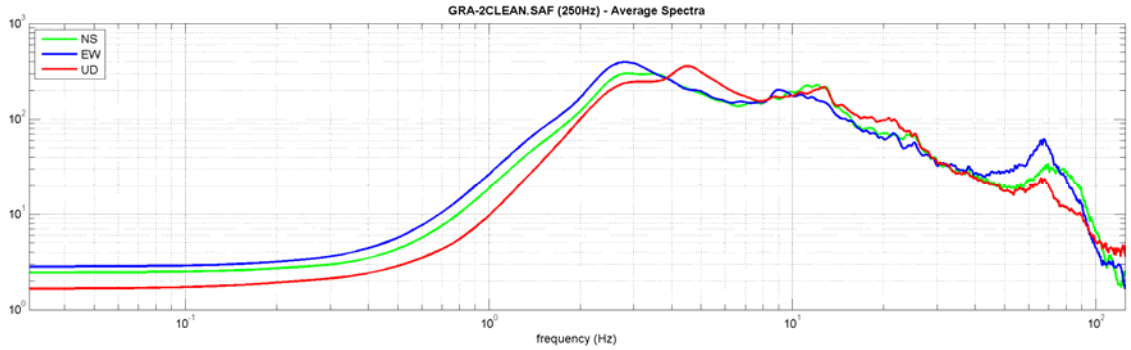
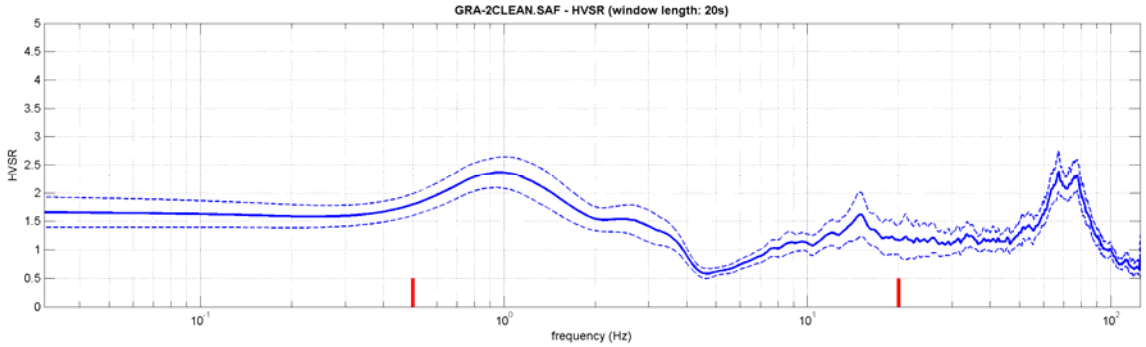
UD
NS
EW
components


GRA-2CLEAN.SAF (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)

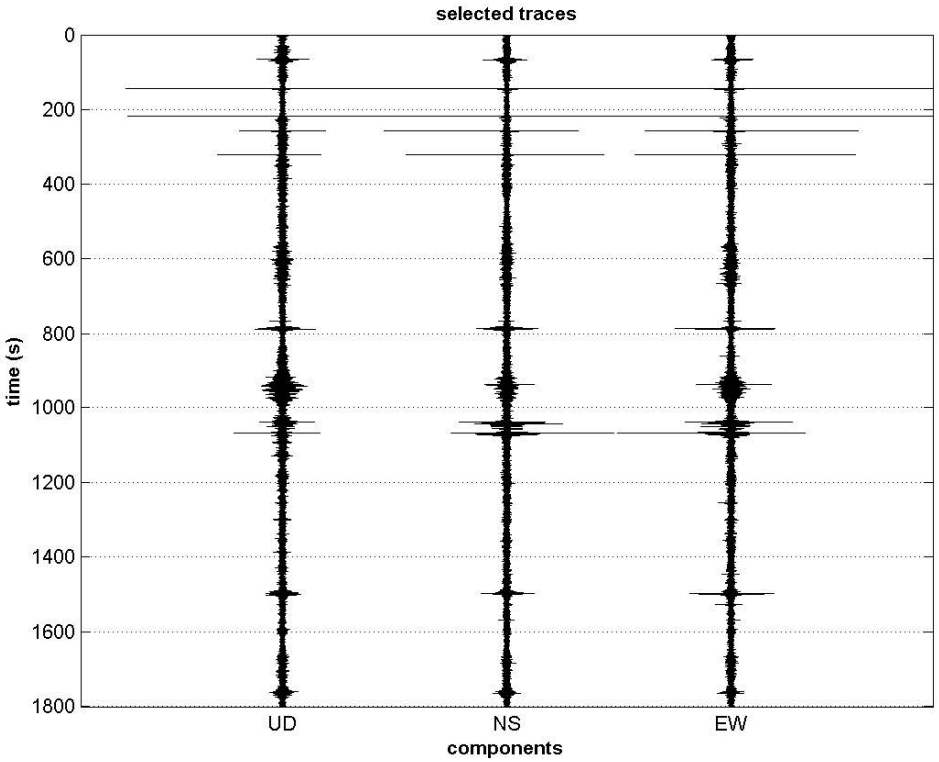

GRA-2CLEAN.SAF - HVSR (window length: 20s)
HVSR
frequency (Hz)

HV-3

Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRA-3.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 29.1
Tapering (%): 10
==========

In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 0.9
Peak HVSR value: 2.4
Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 0.9 > 0.5 (OK)
#2. [nc > 200]: 3063 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)
Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: yes, at frequency 1.9Hz (OK)
#3. [A0 > 2]: 2.4 > 2 (OK)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 7.453 > 0.133 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.275 < 2 (OK)


selected traces
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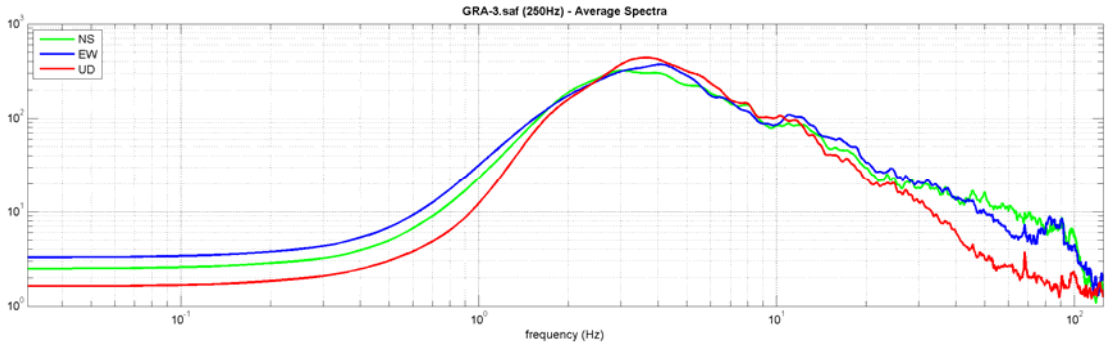
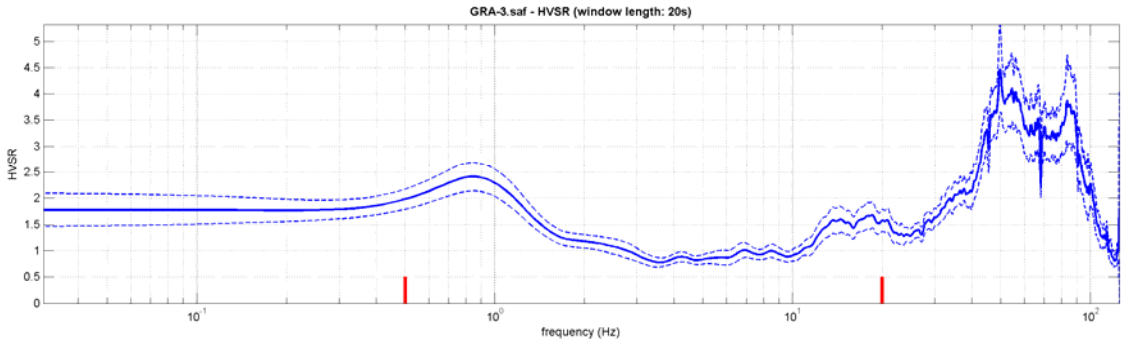
NS
EW
components


GRA-3.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)

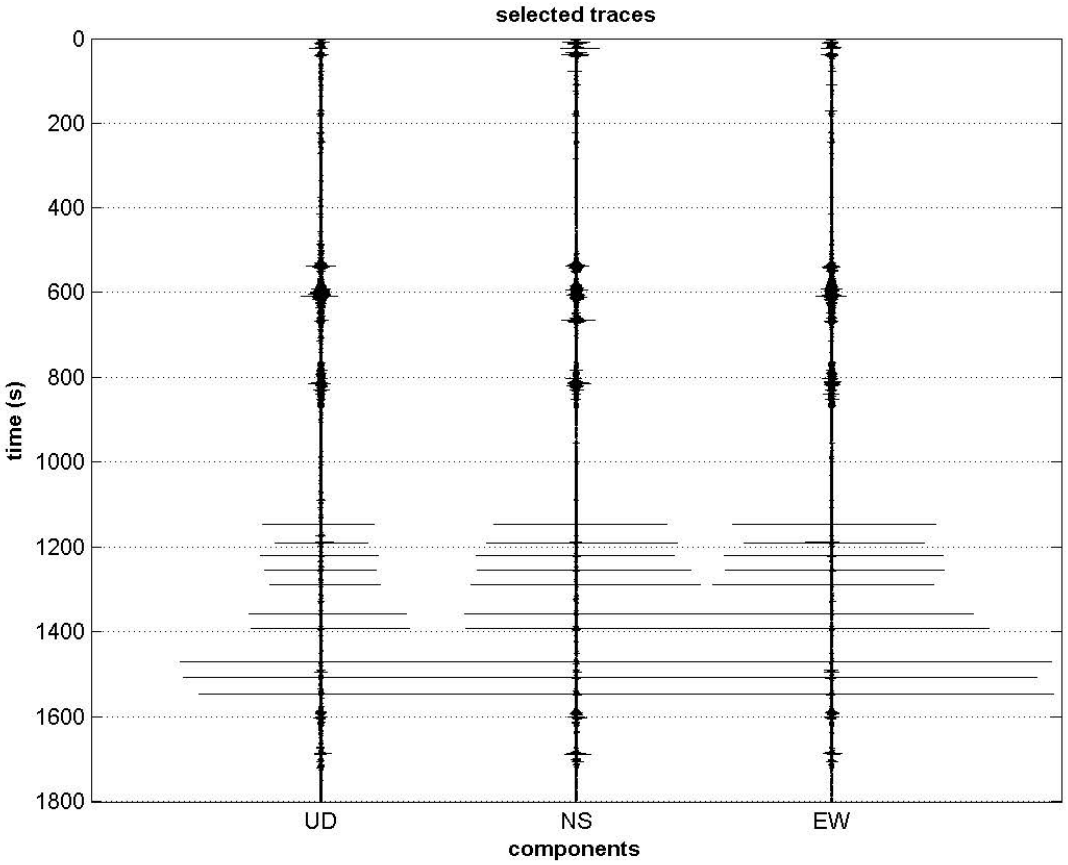

GRA-3.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

HV-4

Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRAZ4.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 28.6
Tapering (%): 10
==========

In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 1.0
Peak HVSR value: 1.9
Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 0.5 > 0.5 (OK)
#2. [nc > 200]: 1764 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)
Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: yes, at frequency 1.7Hz (OK)
#3. [A0 > 2]: 1.9 < 2 (NO)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (NO)
#5. [sigmaf < epsilon(f0)]: 5.104 > 0.078 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.253 < 2 (OK)


selected traces
time (s)
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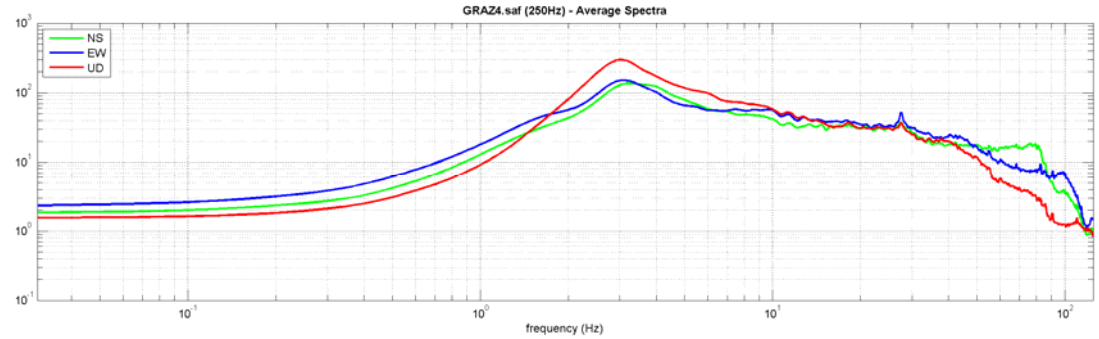
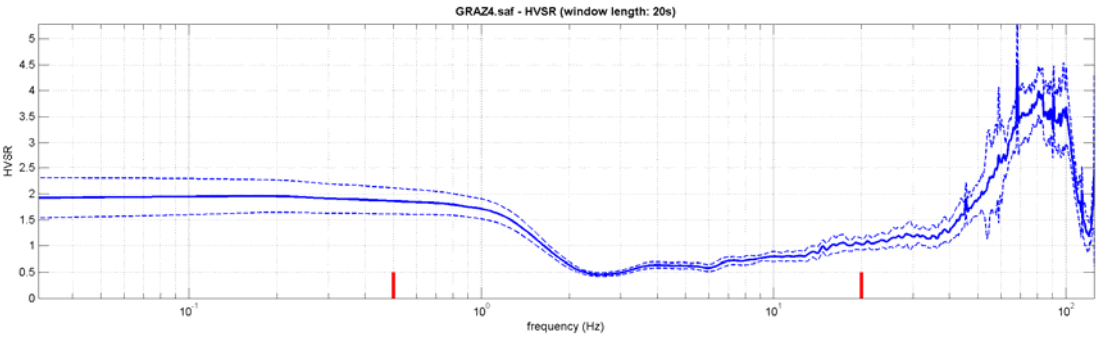
1400
1600
1800
UD
NS
EW
components


GRAZ4.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)

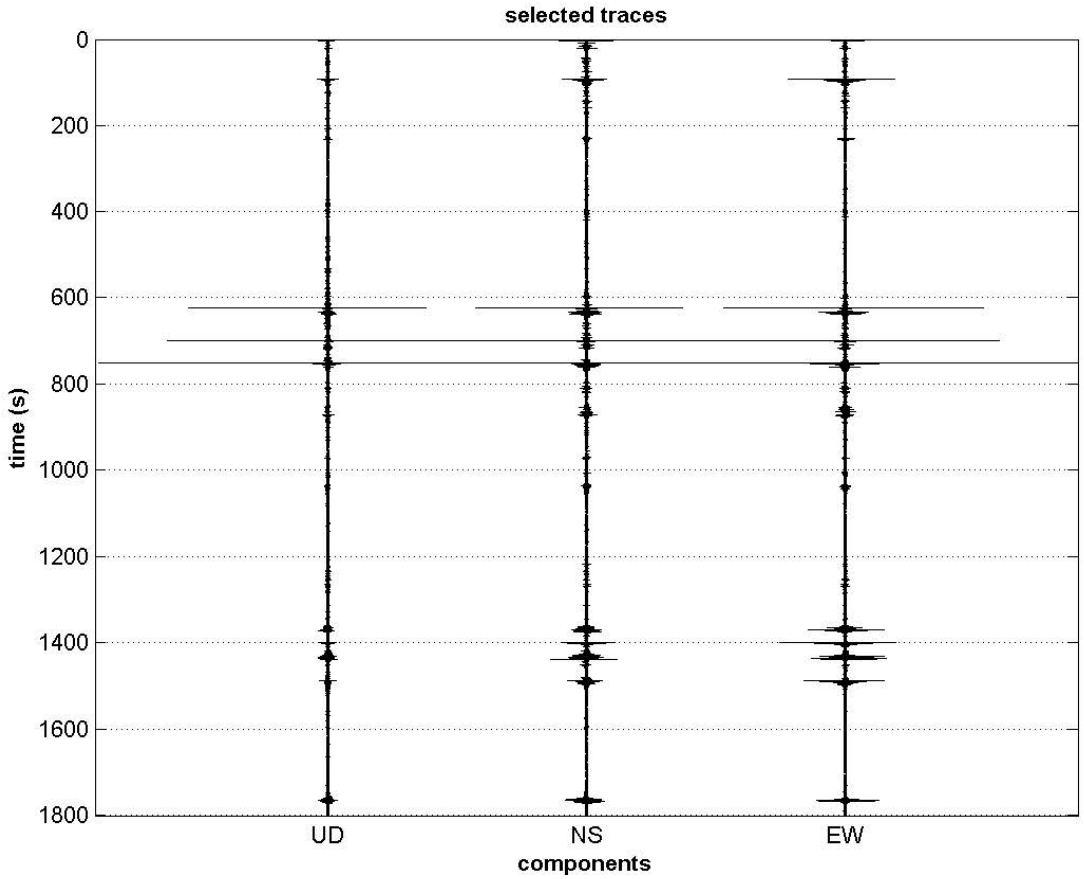

GRAZ4.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

HV-5

Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRAZ5.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 28.8
Tapering (%): 10
==========

In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 0.9
Peak HVSR value: 2.5
Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 14.0 > 0.5 (OK)
#2. [nc > 200]: 48303 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)
Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: yes, at frequency 7.3Hz (OK)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: (NO)
#3. [A0 > 2]: 2.5 > 2 (OK)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 5.432 > 0.702 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.367 < 1.58 (OK)


selected traces
time (s)
0
200
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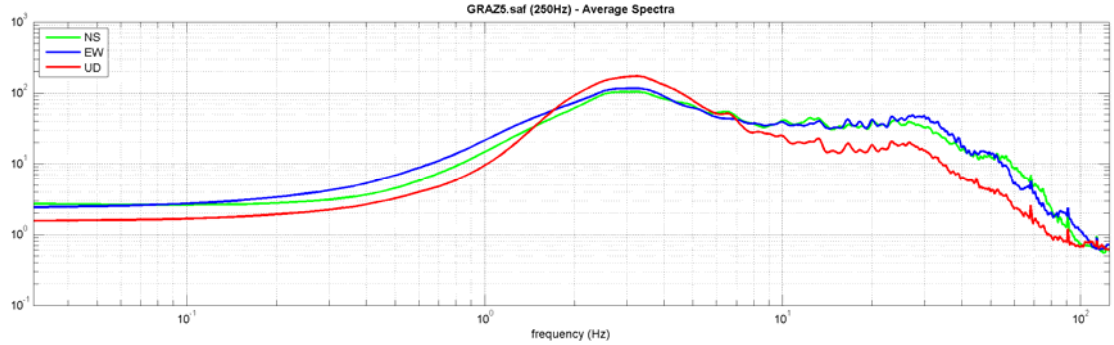
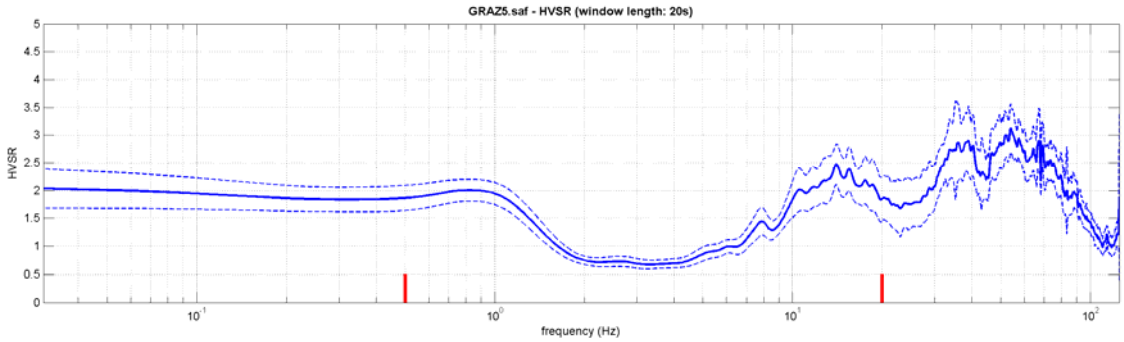
1000
1200
1400
1600
1800
UD
NS
EW
components


GRAZ5.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)

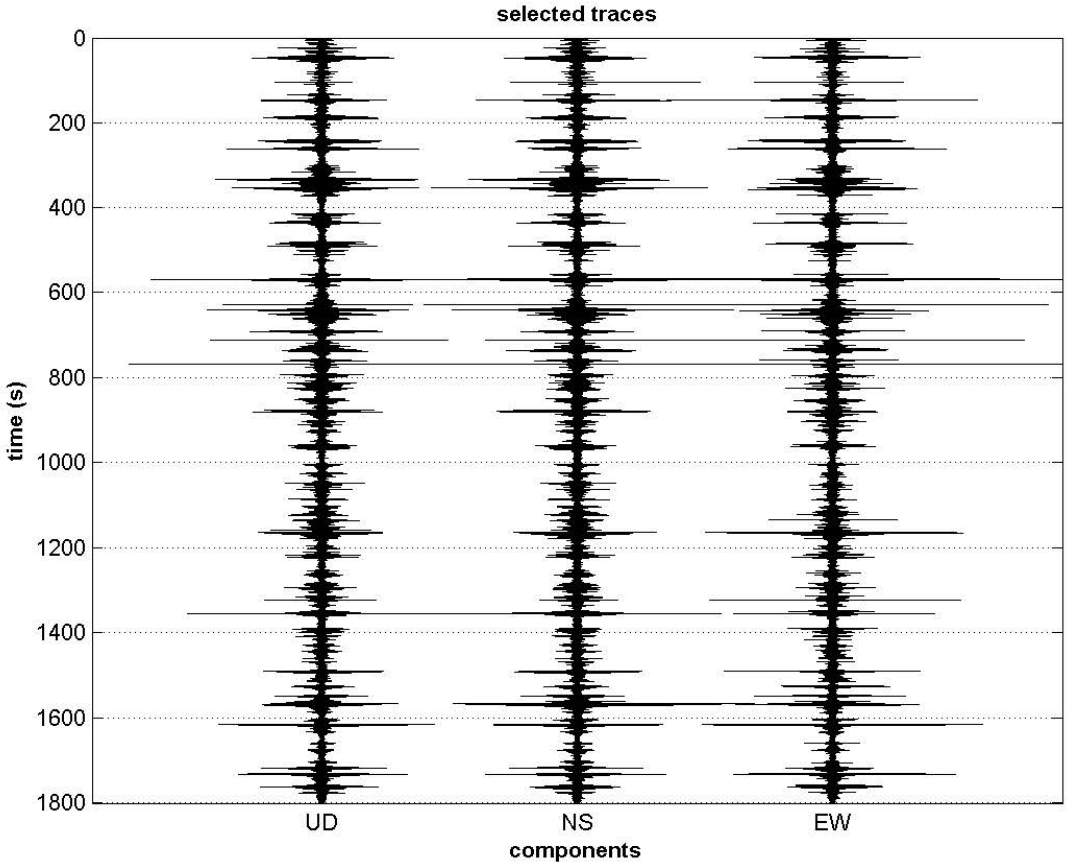

GRAZ5.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

HV-6

Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRAZ6.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 23.6
Tapering (%): 10
==========

In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 0.8
Peak HVSR value: 1.6
Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 0.8 > 0.5 (OK)
#2. [nc > 200]: 2137 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)
Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: (NO)
#3. [A0 > 2]: 1.6 < 2 (NO)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (NO)
#5. [sigmaf < epsilon(f0)]: 8.313 > 0.114 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.200 < 2 (OK)


selected traces
time (s)
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200
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600
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1000
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1400
1600
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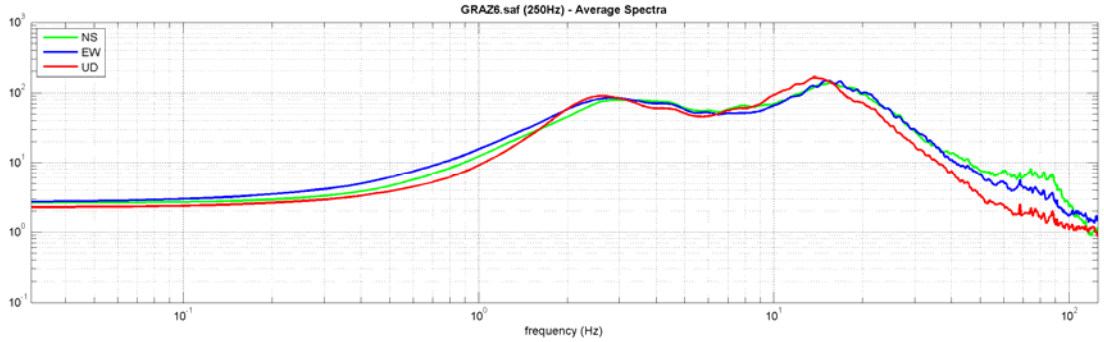
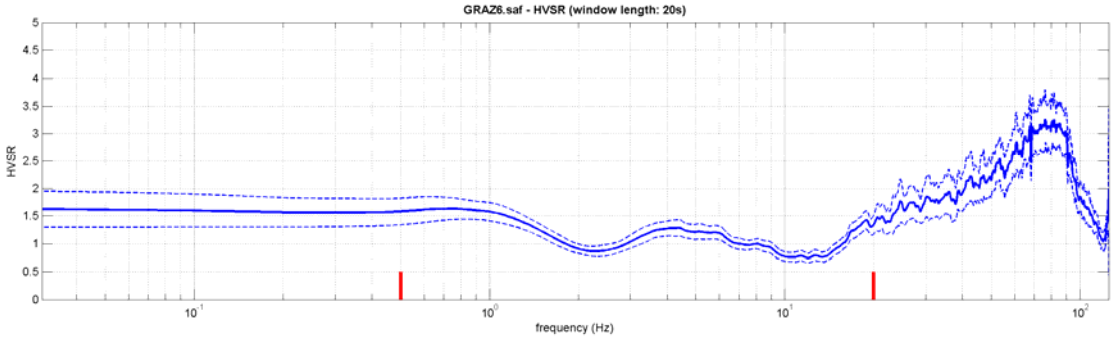
UD
NS
EW
components


GRAZ6.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)


GRAZ6.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

HV-7

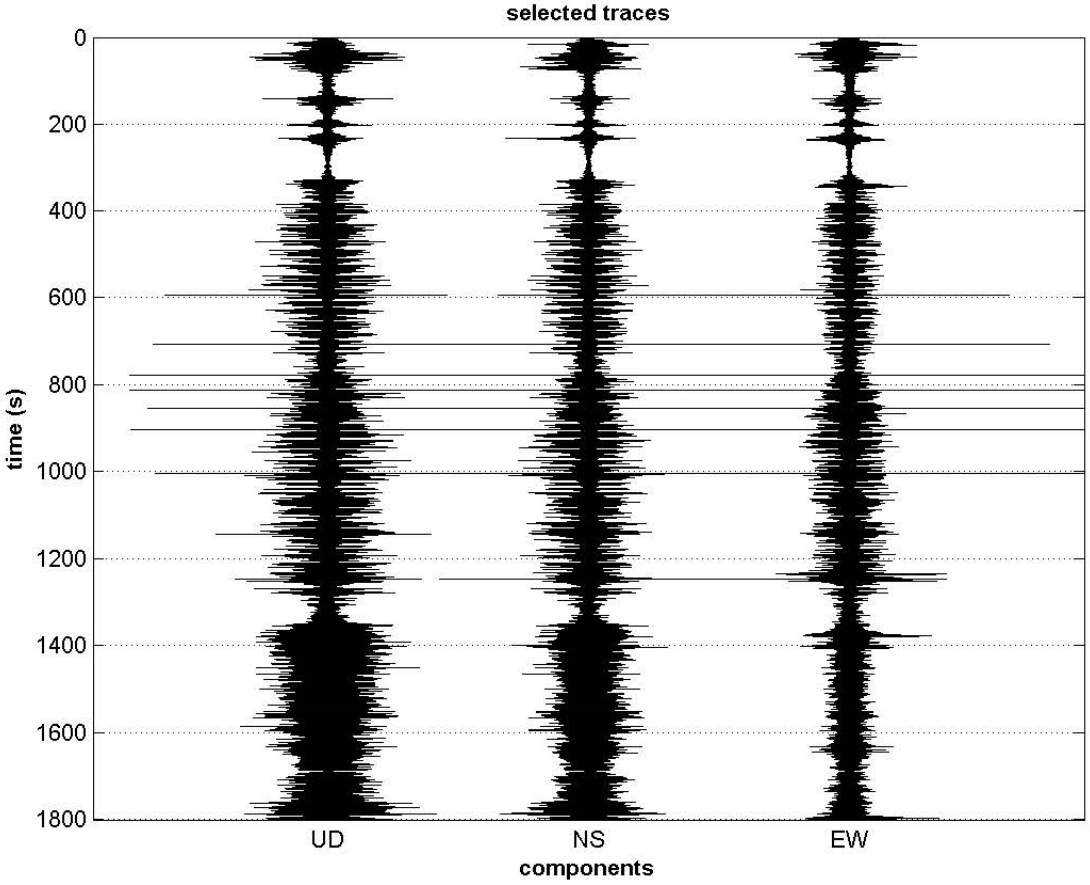
Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRAZ7.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 24.9
Tapering (%): 10
==========

In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 0.9
Peak HVSR value: 2.1
Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 0.9 > 0.5 (OK)
#2. [nc > 200]: 2620 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)

Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========

#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: yes, at frequency 1.8Hz (OK)
#3. [A0 > 2]: 2.1 > 2 (OK)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (NO)
#5. [sigmaf < epsilon(f0)]: 3.031 > 0.133 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.321 < 2 (OK)



selected traces
time (s)
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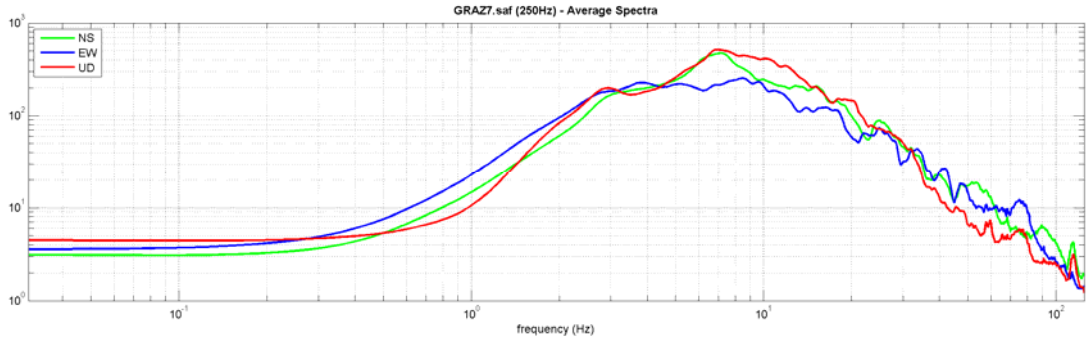
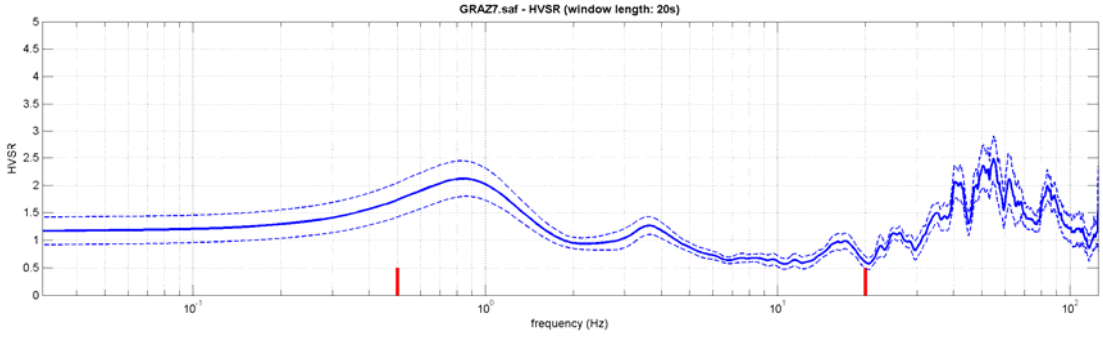
NS
EW
components


GRAZ7.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)


GRAZ7.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

HV-8

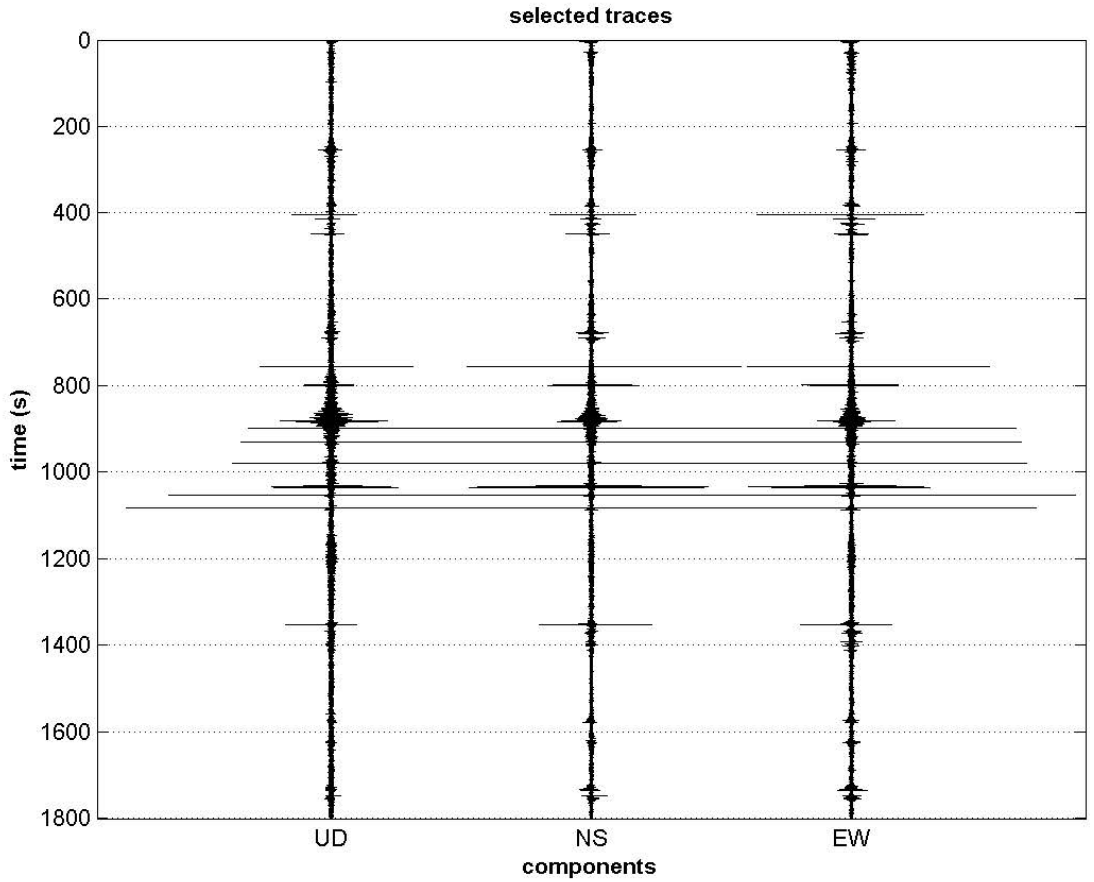
Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRAZ8.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 28.7
Tapering (%): 10
==========

In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 1.0
Peak HVSR value: 1.9

Criteria for a reliable H/V curve ==========

#1. [f0 > 10/Lw]: 1.0 > 0.5 (OK)
#2. [nc > 200]: 3529 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)
Criteria for a clear H/V peak (at least 5 should be fulfilled) ========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: yes, at frequency 1.8Hz (OK)
#3. [A0 > 2]: 1.9 < 2 (NO)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 6.257 > 0.104 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.245 < 1.78 (OK)


selected traces
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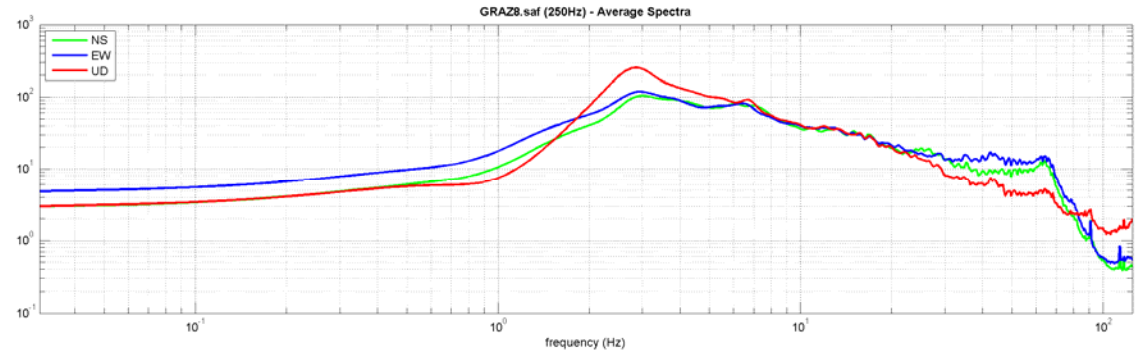
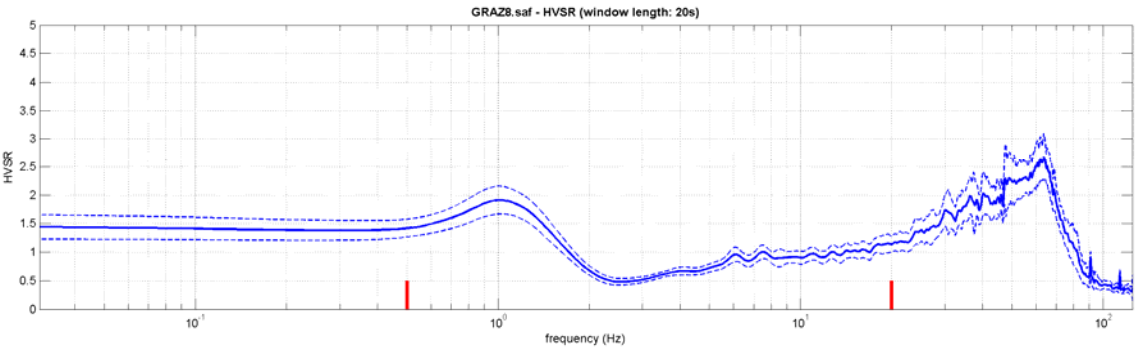
EW
components


GRAZ8.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)


GRAZ8.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

HV-9

Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRAZ9.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 28.9
Tapering (%): 10
==========

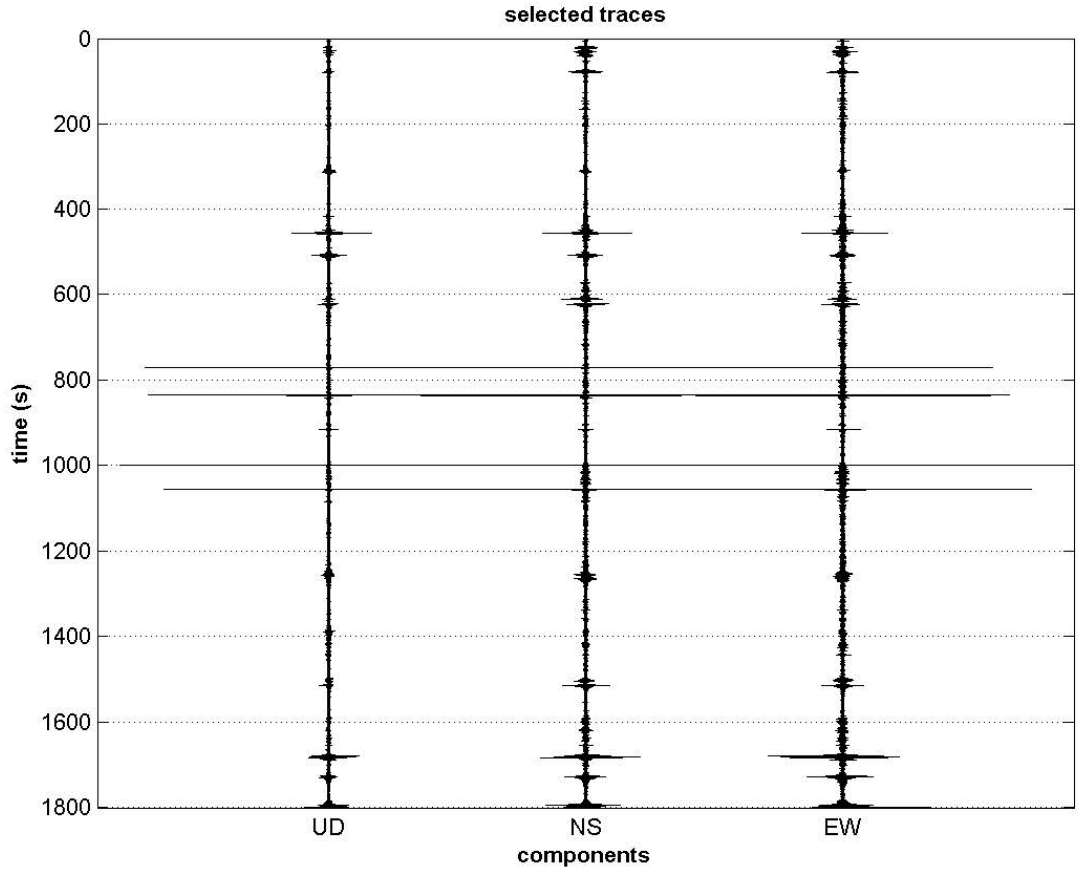
In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 1.1
Peak HVSR value: 2.5

Criteria for a reliable H/V curve ==========

#1. [f0 > 10/Lw]: 20.0 > 0.5 (OK)
#2. [nc > 200]: 68884 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)

Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========

#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: yes, at frequency 10.2Hz (OK)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: (NO)
#3. [A0 > 2]: 2.5 > 2 (OK)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (NO)
#5. [sigmaf < epsilon(f0)]: 6.818 > 1.001 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.477 < 1.58 (OK)


selected traces
time (s)
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1400
1600
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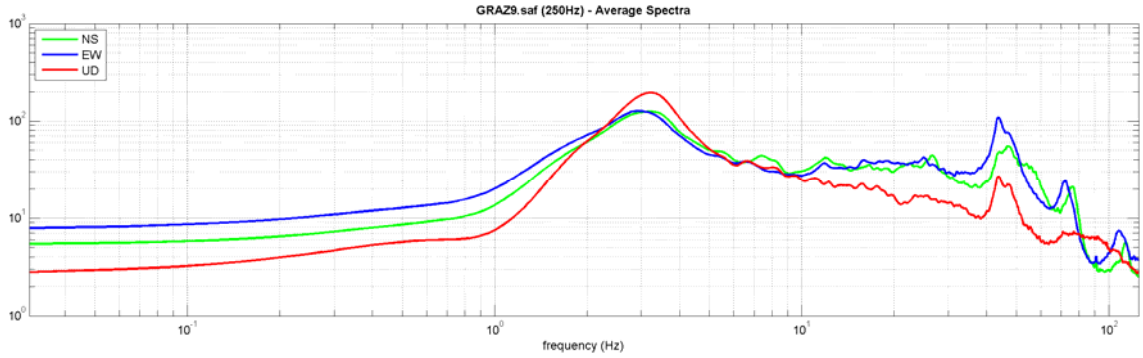
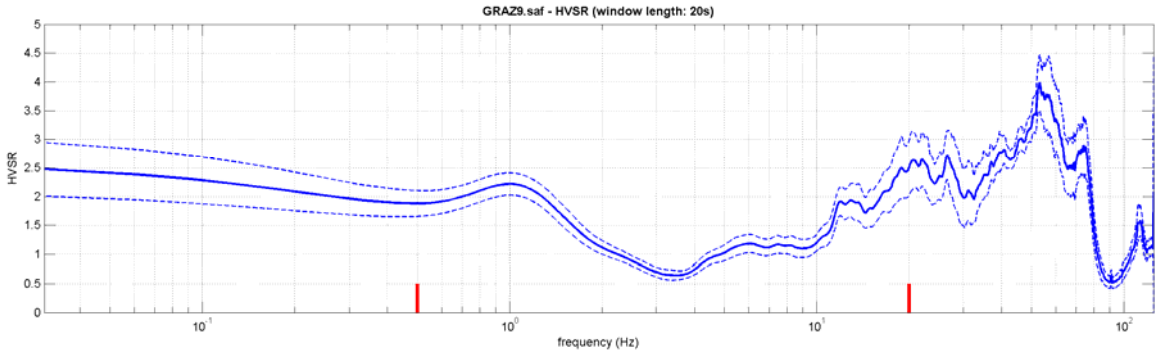
UD
NS
EW
components


GRAZ9.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)


GRAZ9.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

HV-10

Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRAZ10.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 28.3
Tapering (%): 10
==========

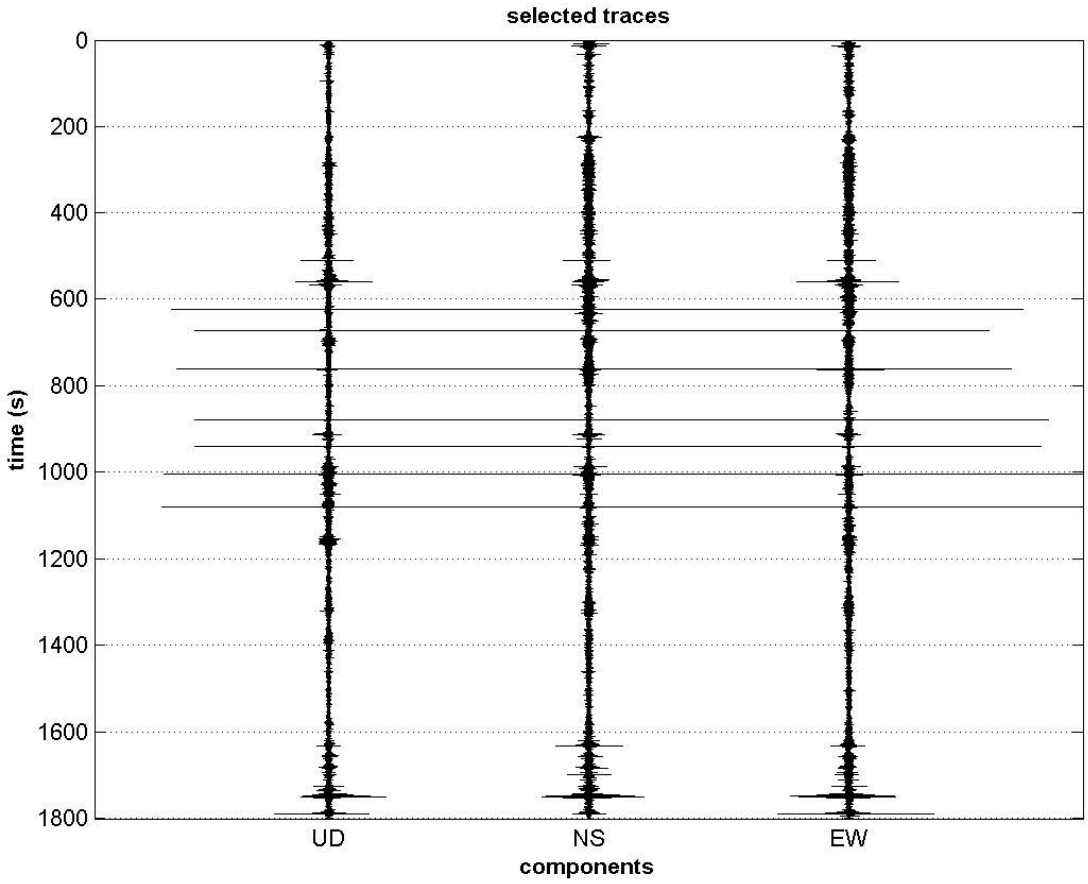
In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 14.0
Peak HVSR value: 1.4

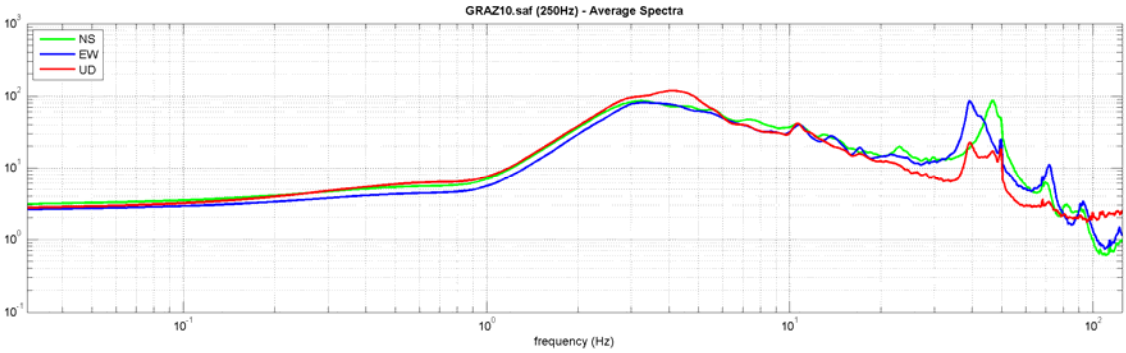
Criteria for a reliable H/V curve ==========

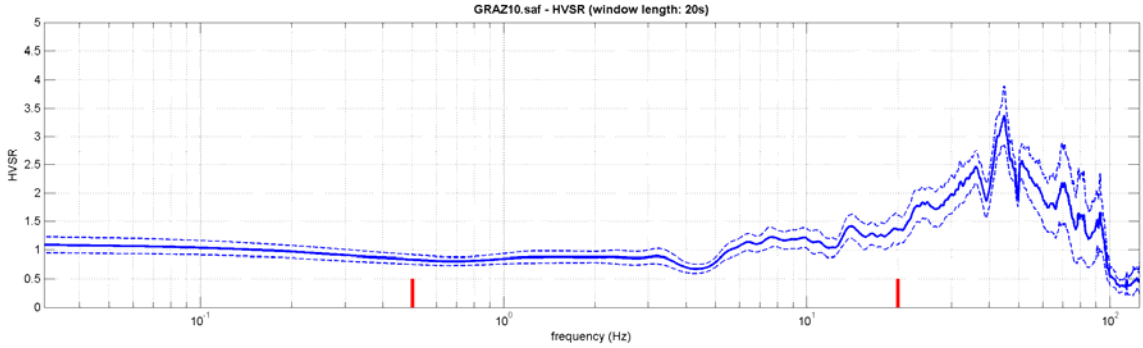
#1. [f0 > 10/Lw]: 14.0 > 0.5 (OK)
#2. [nc > 200]: 47077 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)

Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========

#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: yes, at frequency 4.7Hz (OK)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: (NO)
#3. [A0 > 2]: 1.4 < 2 (NO)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (NO)
#5. [sigmaf < epsilon(f0)]: 4.672 > 0.701 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.205 < 1.58 (OK)


selected traces
time (s)
0
200
400
600
800
1000
1200
1400
1600
1800
UD
NS
EW
components


GRAZ10.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)


GRAZ10.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

HV-11

Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRA-11.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 28.9
Tapering (%): 10
==========

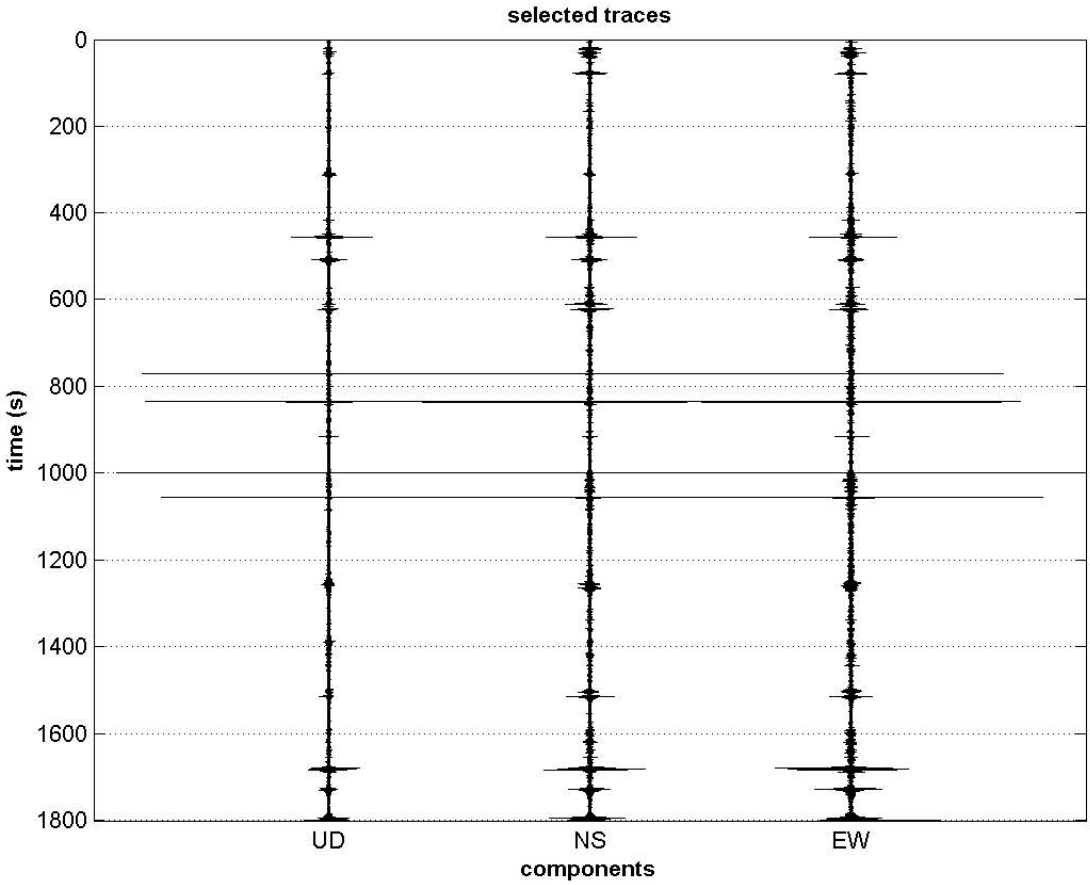
In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 1.0
Peak HVSR value: 2.

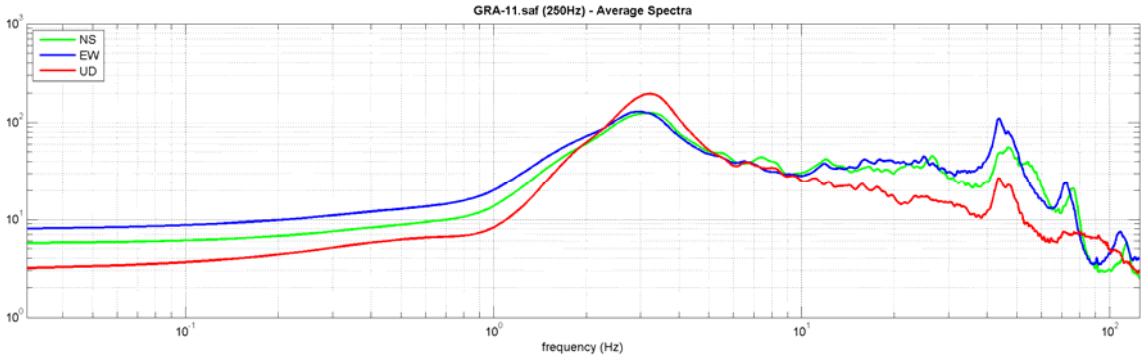
Criteria for a reliable H/V curve ==========

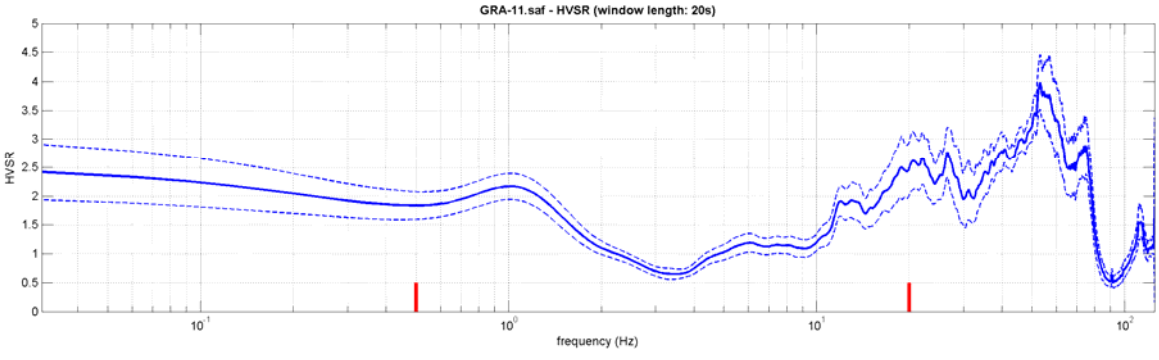
#1. [f0 > 10/Lw]: 18.9 > 0.5 (OK)
#2. [nc > 200]: 64999 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)

Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========

#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: yes, at frequency 10.2Hz (OK)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: (NO)
#3. [A0 > 2]: 2.5 > 2 (OK)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (NO)
#5. [sigmaf < epsilon(f0)]: 6.744 > 0.945 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.551 < 1.58 (OK)


selected traces
time (s)
0
200
400
600
800
1000
1200
1400
1600
1800
UD
NS
EW
components


GRA-11.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)

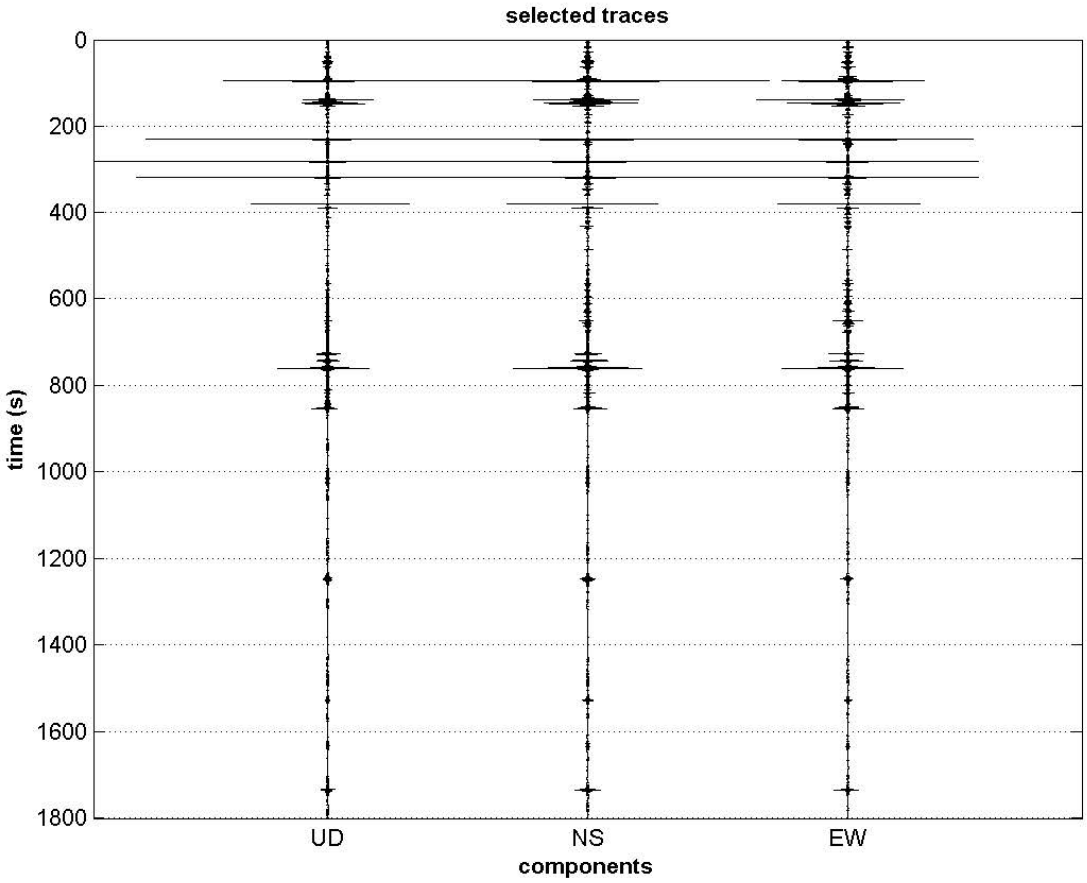

GRA-11.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

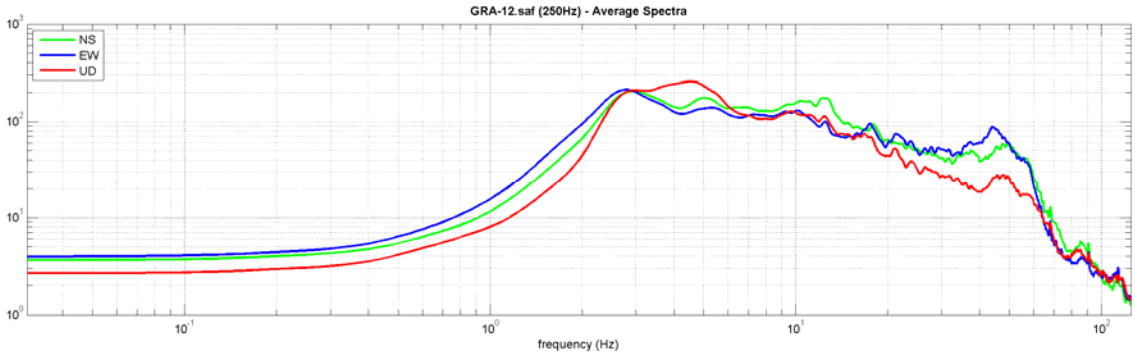
HV-12

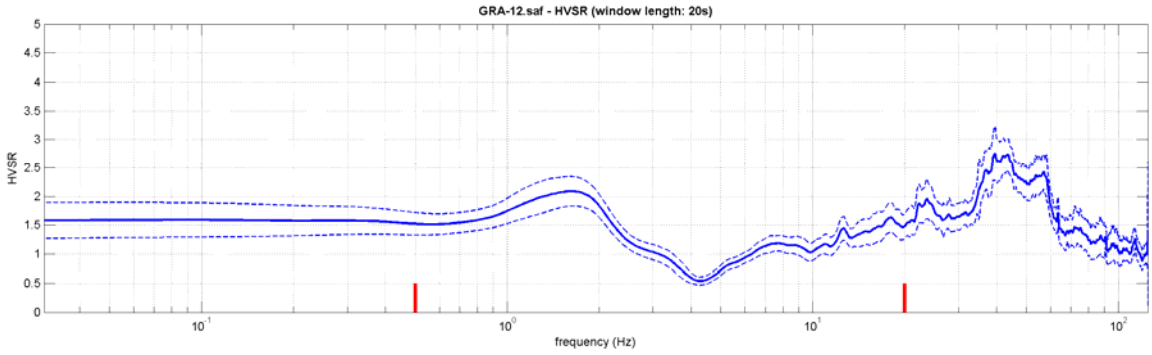
Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRA-12.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 28.9
Tapering (%): 10
==========

In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 1.6
Peak HVSR value: 2.1
Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 1.6 > 0.5 (OK)
#2. [nc > 200]: 5670 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)
Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: yes, at frequency 3.0Hz (OK)
#3. [A0 > 2]: 2.1 > 2 (OK)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 7.608 > 0.165 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.258 < 1.78 (OK)


selected traces
time (s)
0
200
400
600
800
1000
1200
1400
1600
1800
UD
NS
EW
components


GRA-12.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)

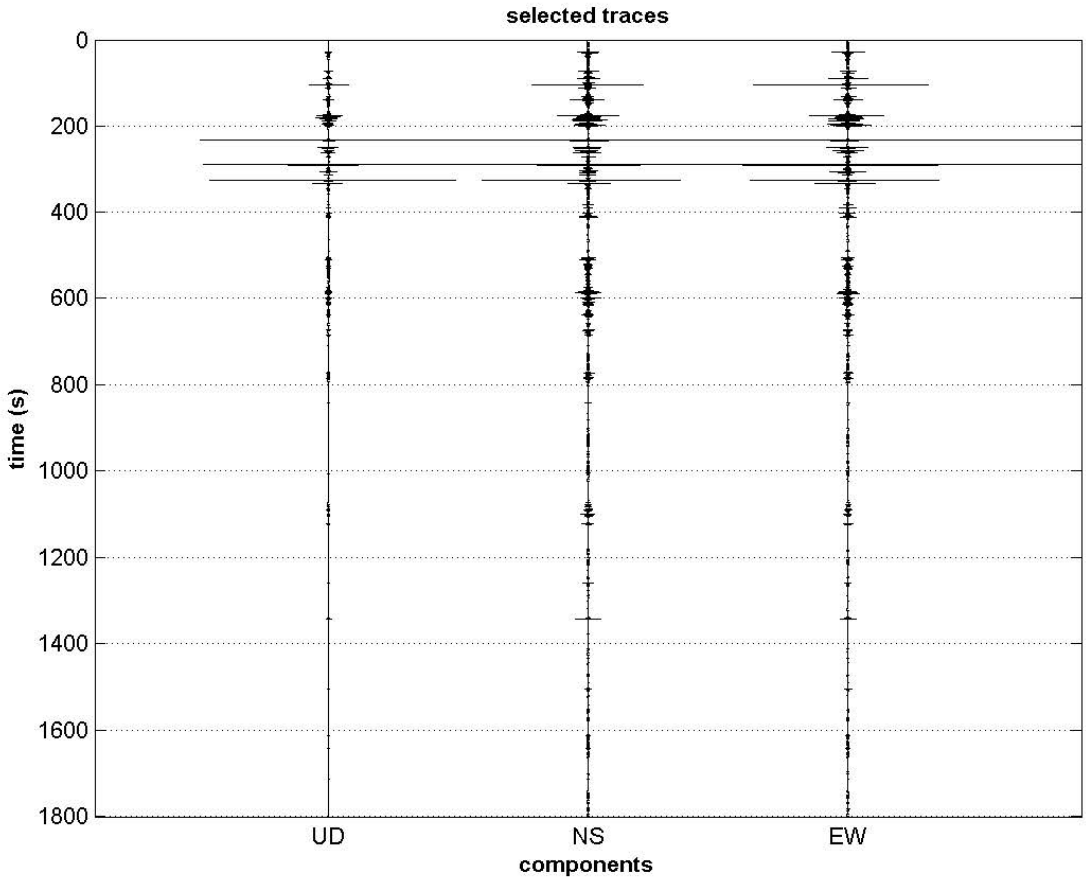

GRA-12.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

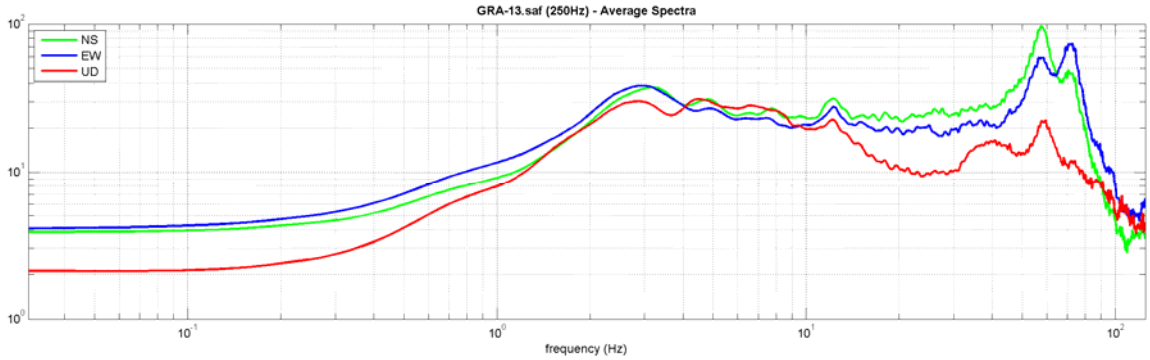
HV-13

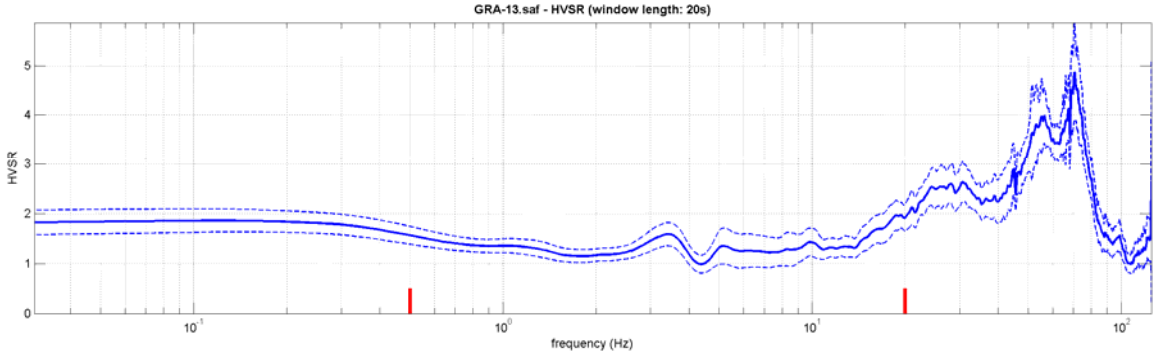
Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRA-13.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 29.4
Tapering (%): 10
==========

In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 3.5
Peak HVSR value: 2.0
Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 19.5 > 0.5 (OK)
#2. [nc > 200]: 68162 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)
Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: (NO)
#3. [A0 > 2]: 2.0 < 2 (NO)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 6.537 > 0.974 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.254 < 1.58 (OK)


selected traces
time (s)
0
200
400
600
800
1000
1200
1400
1600
1800
UD
NS
EW
components


GRA-13.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)

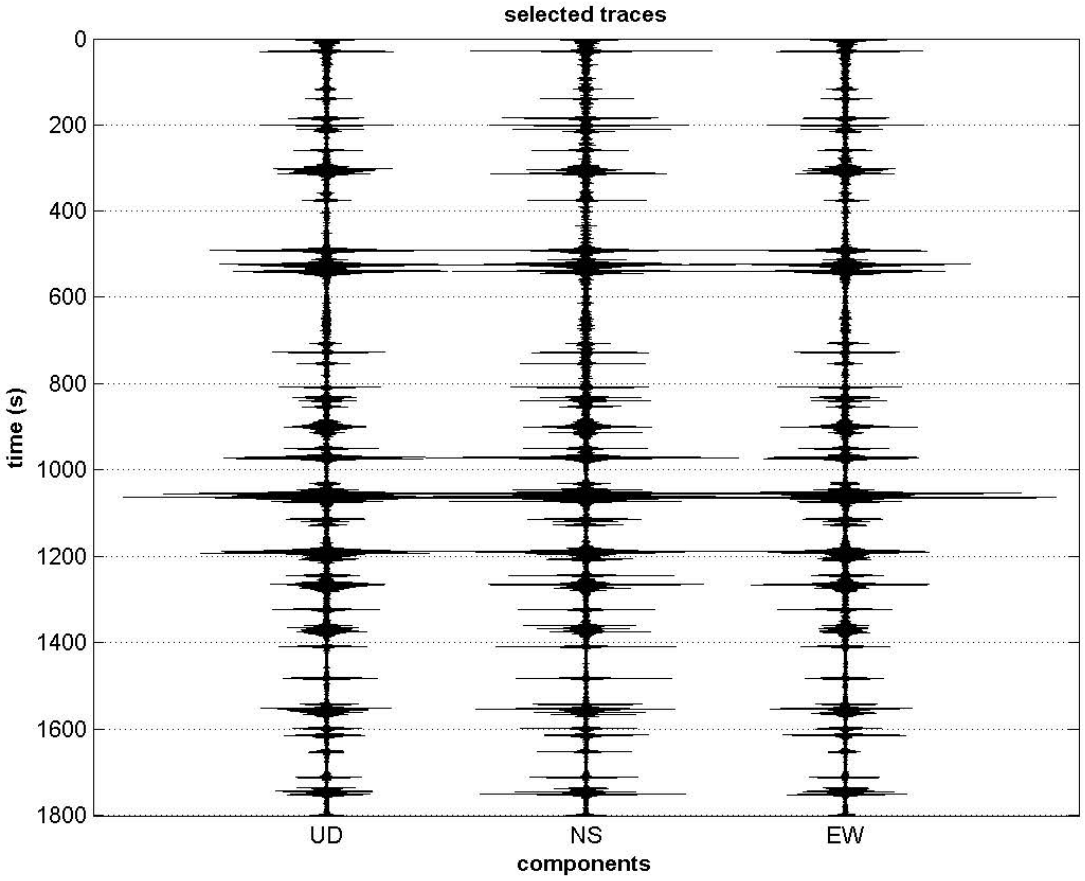

GRA-13.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

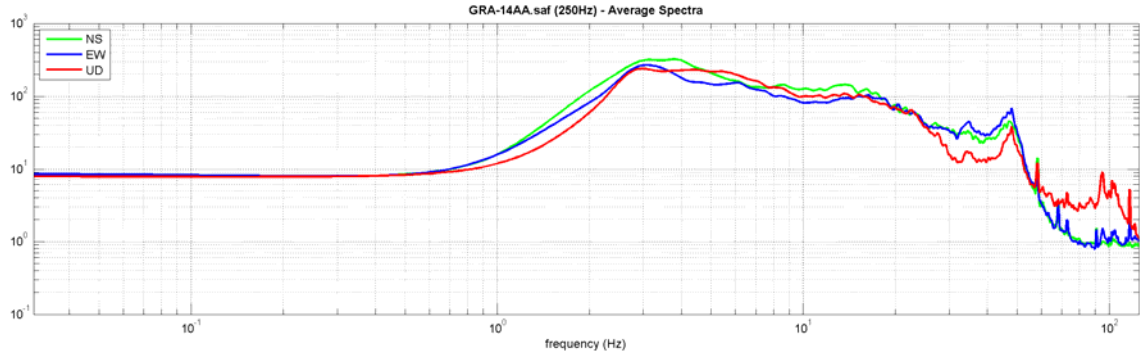
HV-14

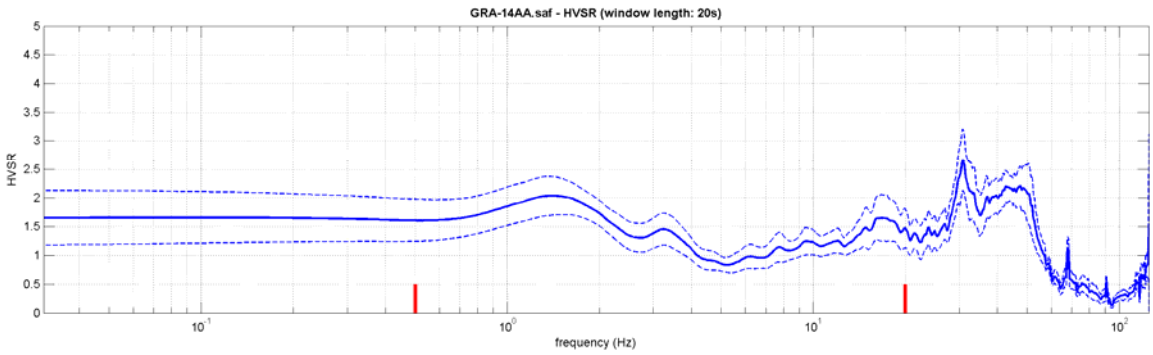
Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRA-14AA.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 22.8
Tapering (%): 10
==========

In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 1.4
Peak HVSR value: 2.0
Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 1.4 > 0.5 (OK)
#2. [nc > 200]: 3874 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)
Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: yes, at frequency 4.2Hz (OK)
#3. [A0 > 2]: 2.0 > 2 (OK)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (NO)
#5. [sigmaf < epsilon(f0)]: 7.539 > 0.143 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.334 < 1.78 (OK)



selected traces
time (s)
0
200
400
600
800
1000
1200
1400
1600
1800
UD
NS
EW
components


GRA-14AA.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)

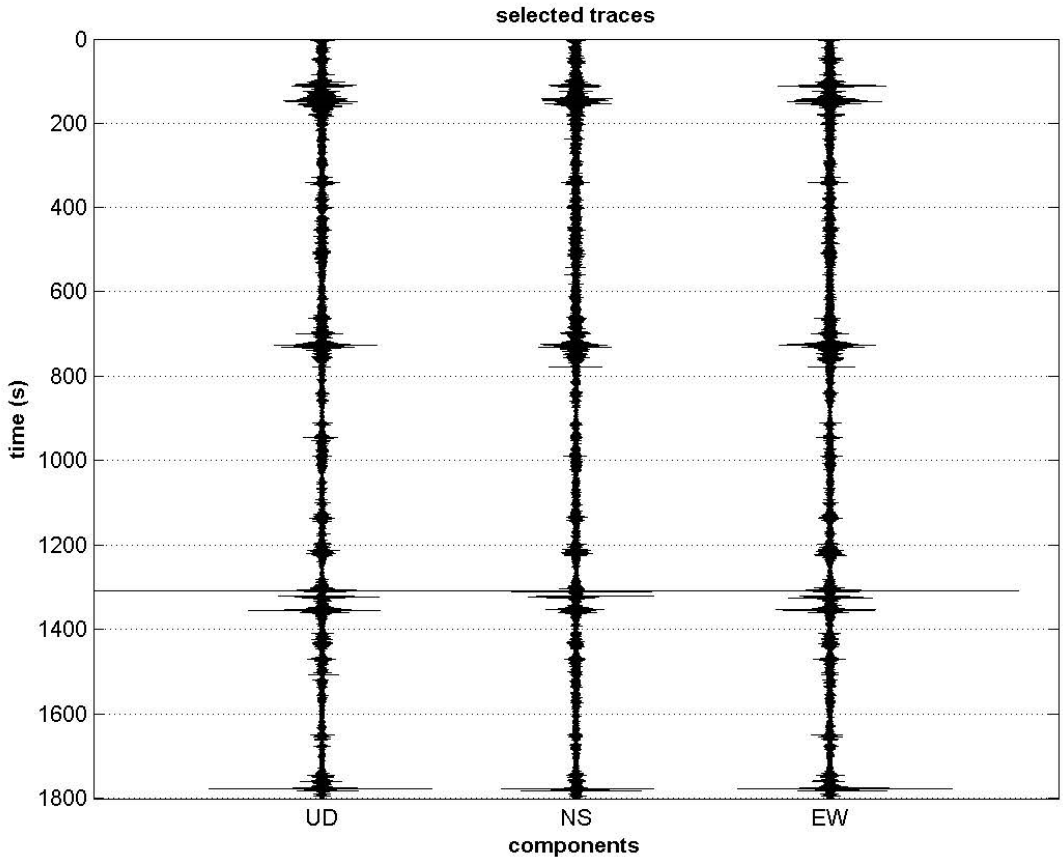

GRA-14AA.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

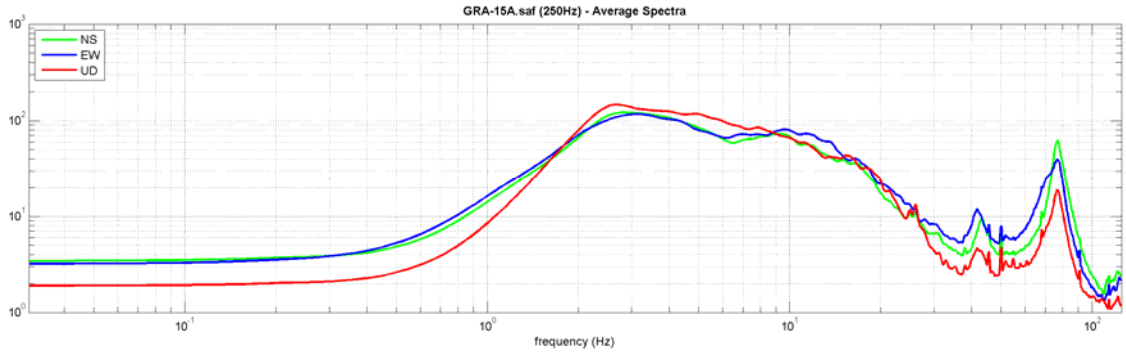
HV-15

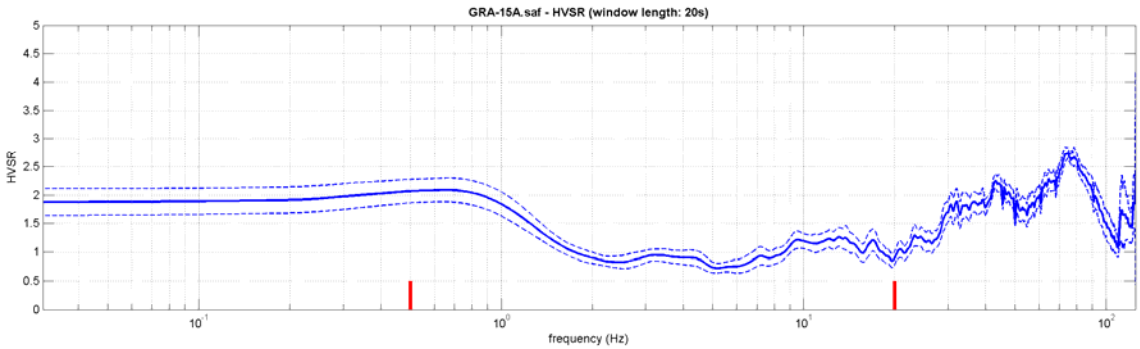
Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRA-15A.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 27.6
Tapering (%): 10
==========

In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 0.7
Peak HVSR value: 2.1
Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 0.7 > 0.5 (OK)
#2. [nc > 200]: 2203 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)
Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: yes, at frequency 1.7Hz (OK)
#3. [A0 > 2]: 2.1 > 2 (OK)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 6.170 > 0.101 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.207 < 2 (OK)


selected traces
time (s)
0
200
400
600
800
1000
1200
1400
1600
1800
UD
NS
EW
components


GRA-15A.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)

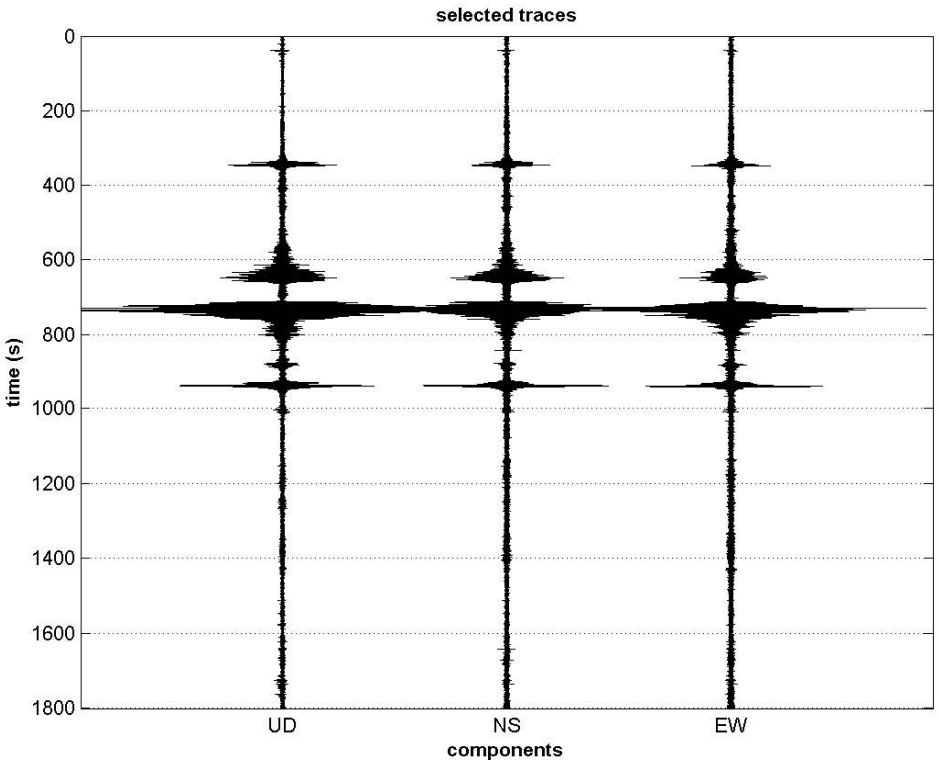

GRA-15A.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

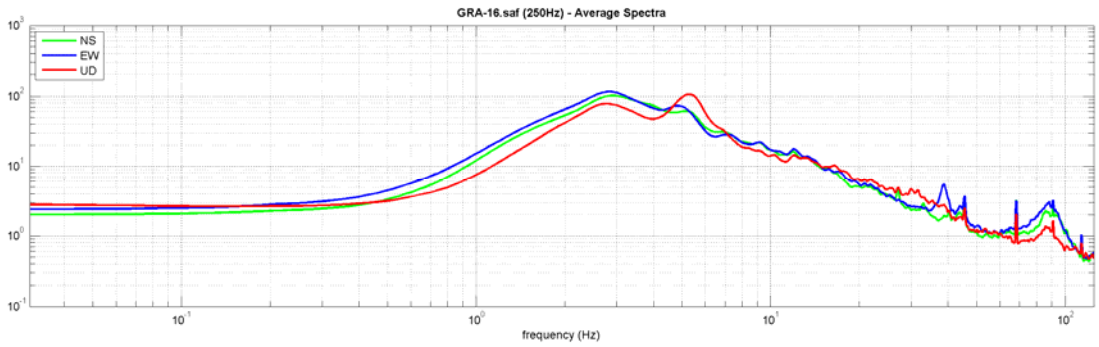
HV-16

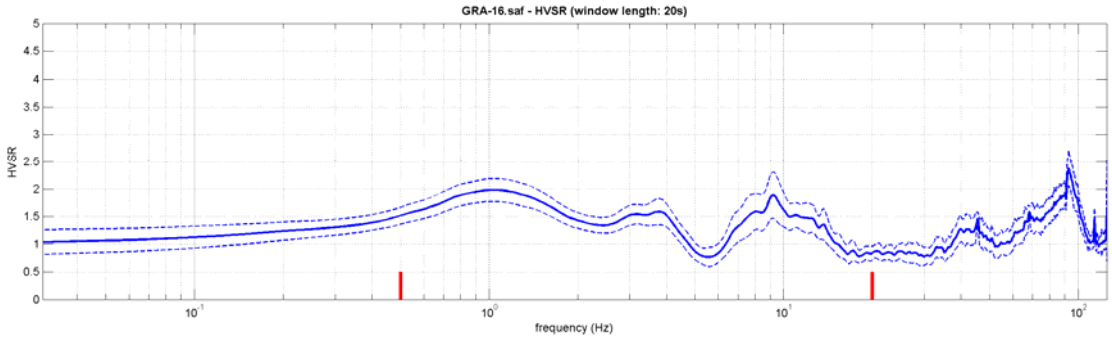
Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRA-16.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 28.1
Tapering (%): 10
==========

In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 1.1
Peak HVSR value: 2.0
Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 1.1 > 0.5 (OK)
#2. [nc > 200]: 3568 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)
Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: (NO)
#3. [A0 > 2]: 2.0 < 2 (NO)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (NO)
#5. [sigmaf < epsilon(f0)]: 4.359 > 0.107 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.207 < 1.78 (OK)


selected traces
time (s)
0
200
400
600
800
1000
1200
1400
1600
1800
UD
NS
EW
components


GRA-16.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)

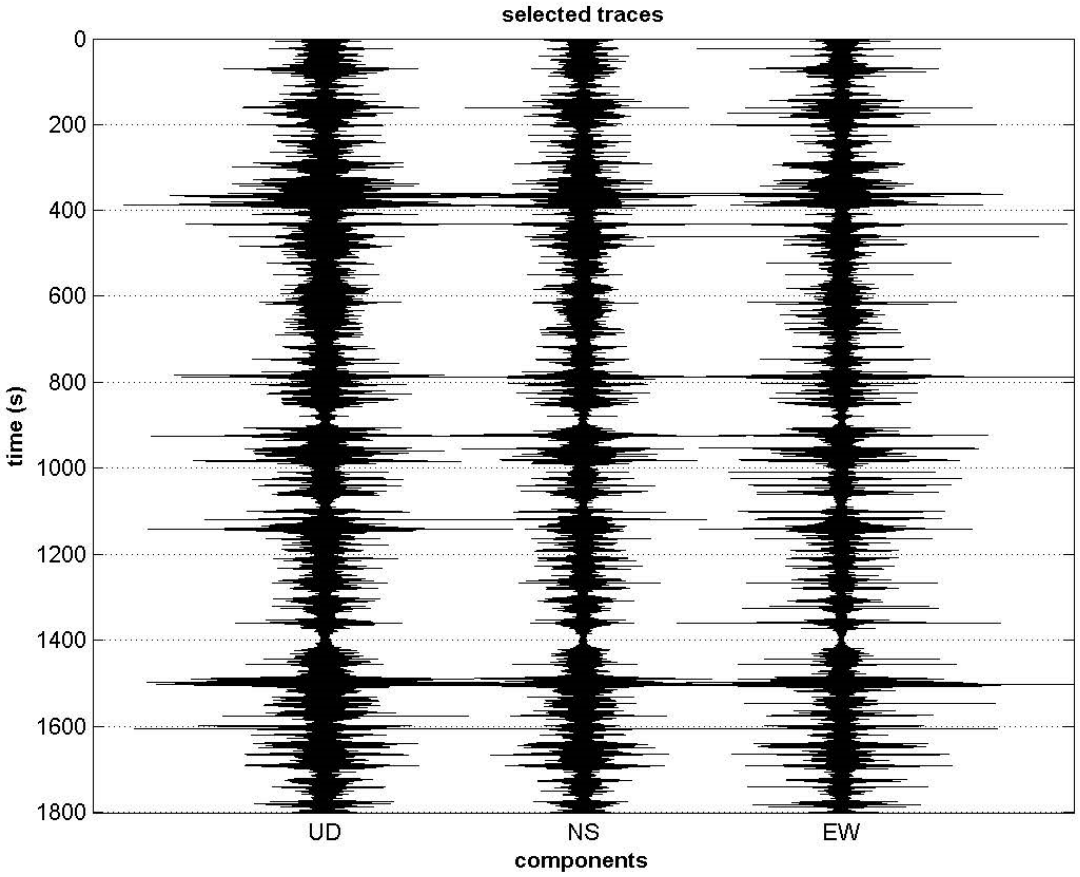

GRA-16.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

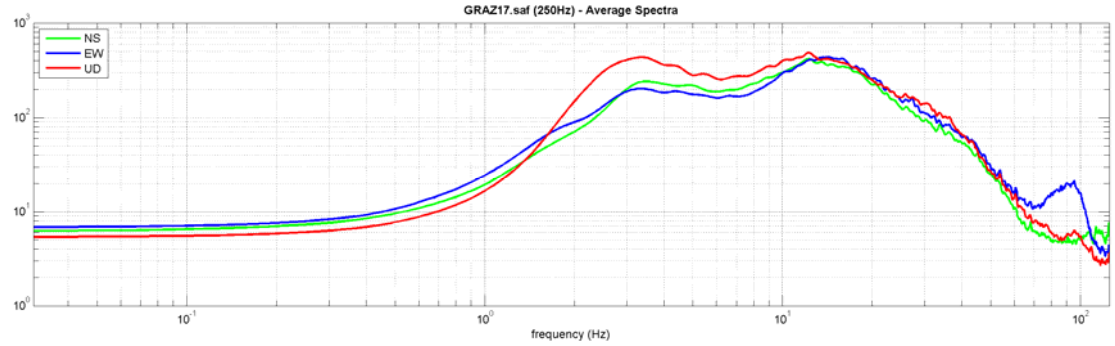
HV-17

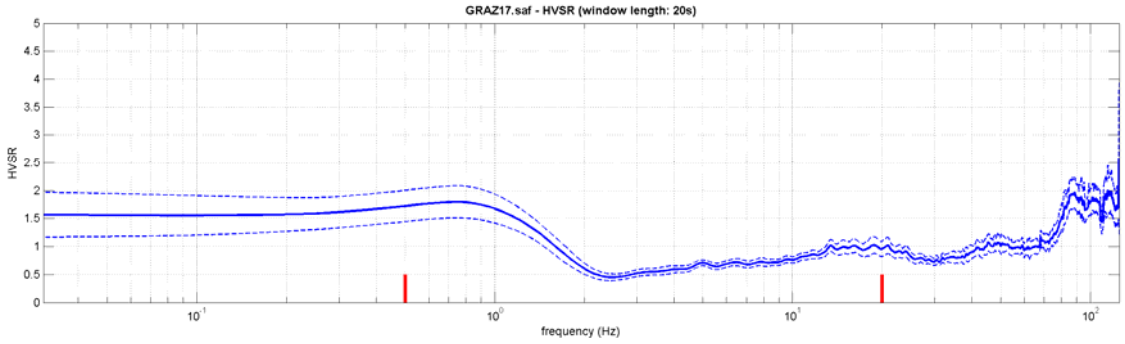
Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRAZ17.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 18.6
Tapering (%): 10
==========

In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 0.8
Peak HVSR value: 1.8
Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 0.8 > 0.5 (OK)
#2. [nc > 200]: 1679 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)
Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: yes, at frequency 1.7Hz (OK)
#3. [A0 > 2]: 1.8 < 2 (NO)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 6.024 > 0.114 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.287 < 2 (OK)


selected traces
time (s)
0
200
400
600
800
1000
1200
1400
1600
1800
UD
NS
EW
components


GRAZ17.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)


GRAZ17.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

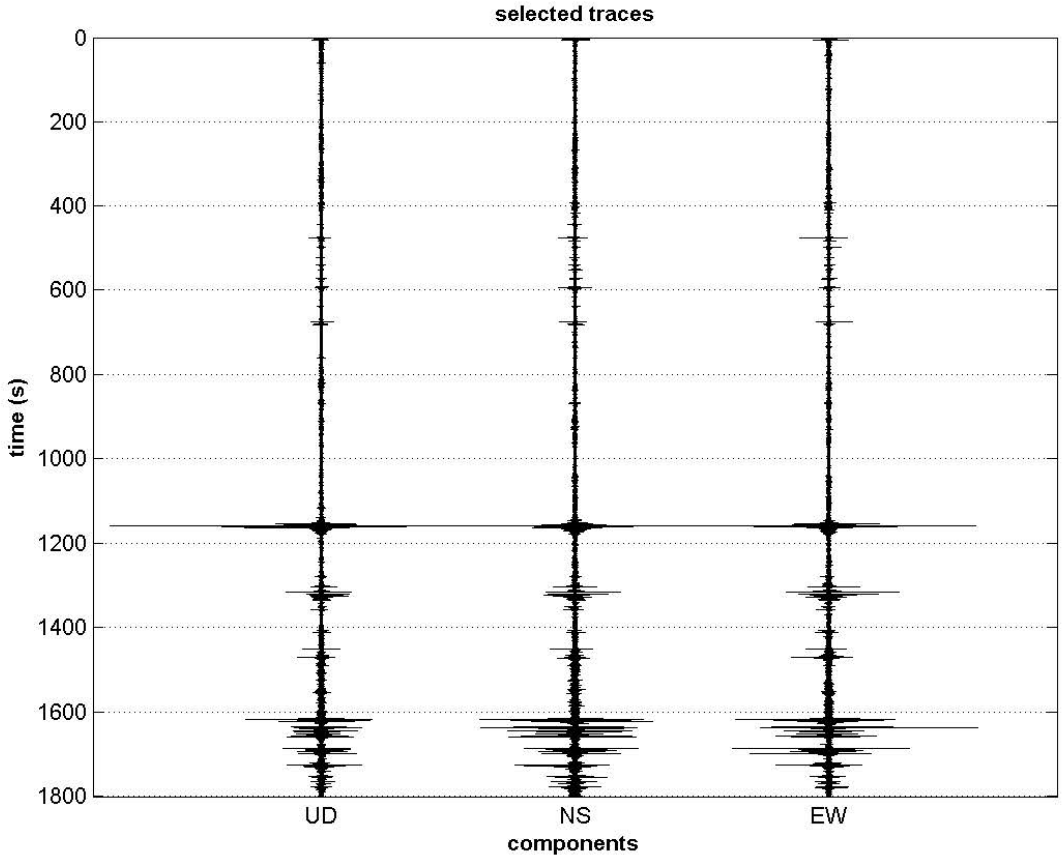
HV-18

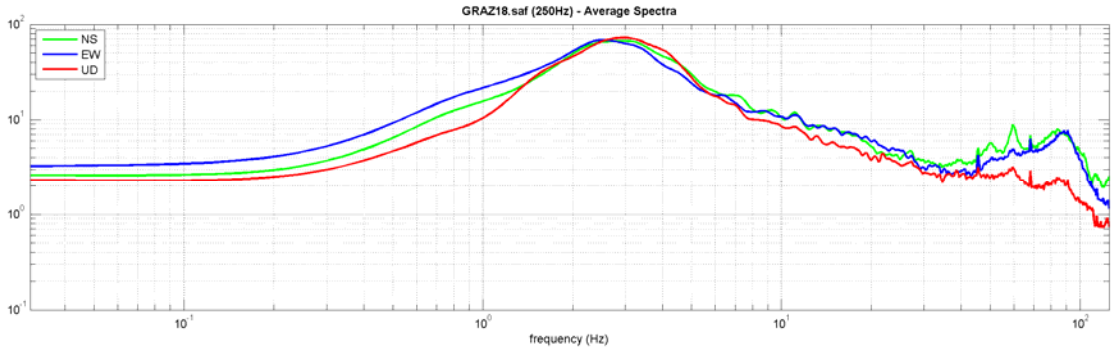
Horizontal-to-Vertical Spectral Ratio from passive seismics

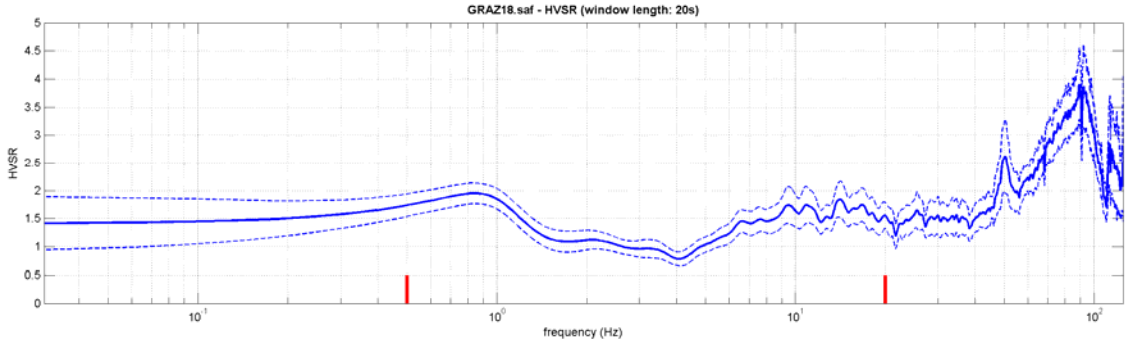
Dataset: GRAZ18.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 27.5
Tapering (%): 10
==========

In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 0.9
Peak HVSR value: 2.0
Criteria for a reliable H/V curve ==========

#1. [f0 > 10/Lw]: 0.9 > 0.5 (OK)
#2. [nc > 200]: 2904 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)
Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: yes, at frequency 2.8Hz (OK)
#3. [A0 > 2]: 2.0 < 2 (NO)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (NO)
#5. [sigmaf < epsilon(f0)]: 5.969 > 0.133 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.183 < 2 (OK)


selected traces
time (s)
0
200
400
600
800
1000
1200
1400
1600
1800
UD
NS
EW
components


GRAZ18.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)

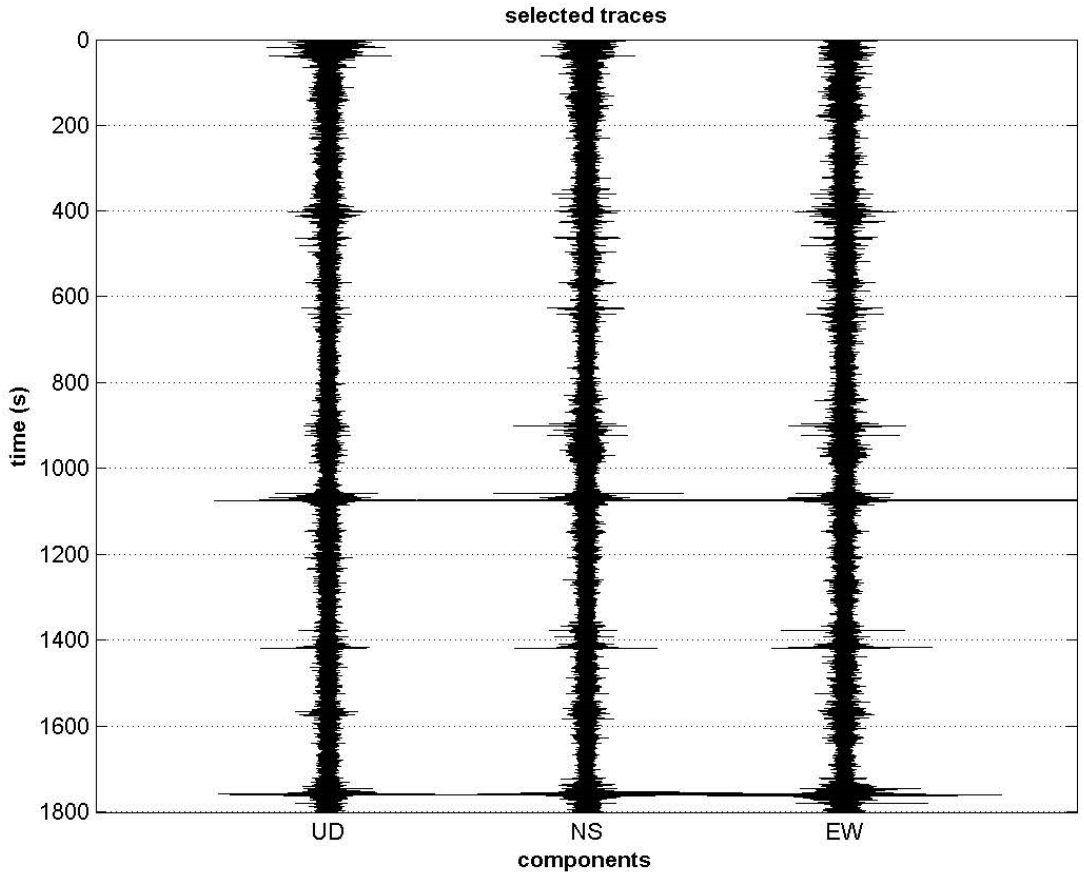

GRAZ18.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

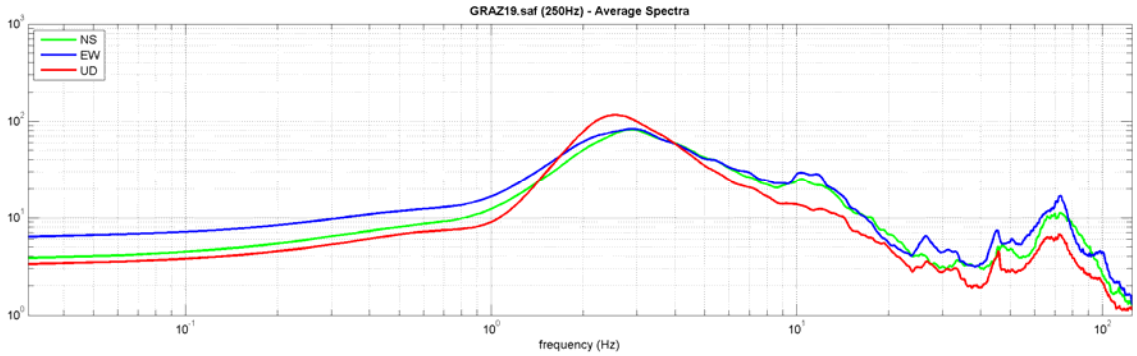
HV-19

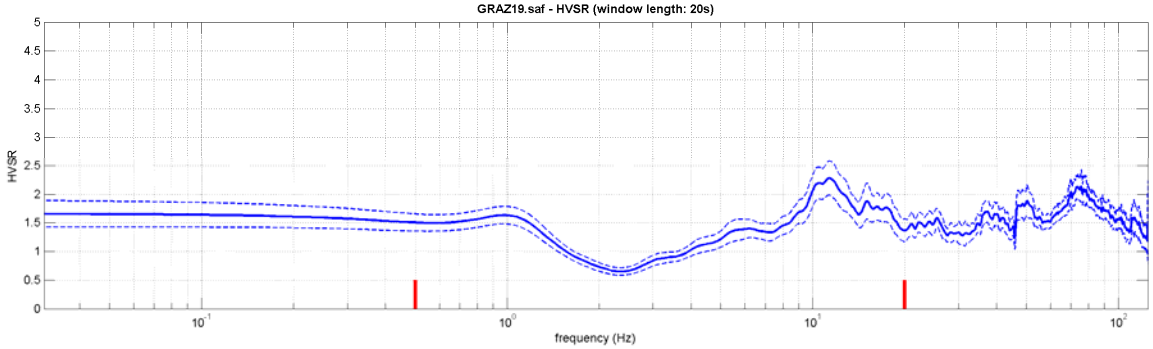
Horizontal-to-Vertical Spectral Ratio from passive seismics

Dataset: GRAZ19.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 26.8
Tapering (%): 10
==========

In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 1.0
Peak HVSR value: 2.3
Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 11.4 > 0.5 (OK)
#2. [nc > 200]: 36110 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)
Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: yes, at frequency 4.6Hz (OK)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: (NO)
#3. [A0 > 2]: 2.3 > 2 (OK)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 2.428 > 0.568 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.298 < 1.58 (OK)


selected traces
0
200
400
600
800
1000
1200
1400
1600
1800
time (s)
UD
NS
EW
components


GRAZ19.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)


GRAZ19.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)

HV-20

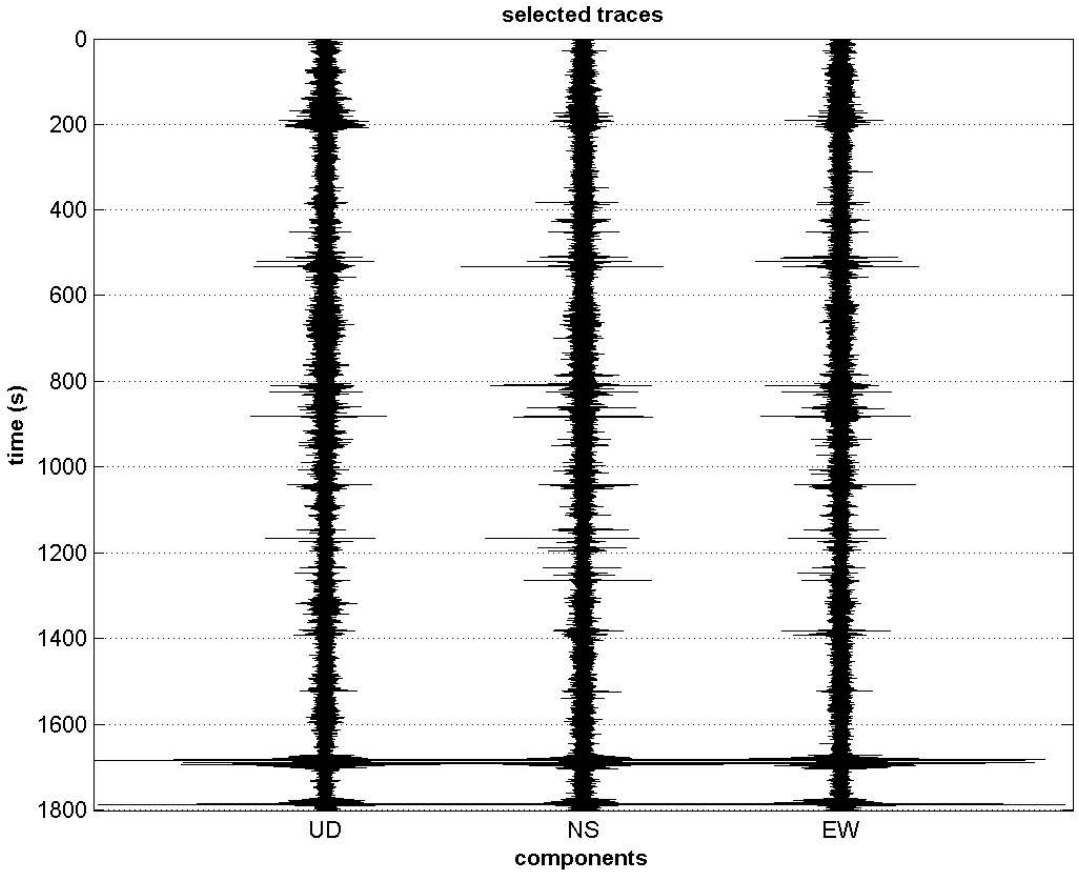
Horizontal-to-Vertical Spectral Ratio from passive seismics

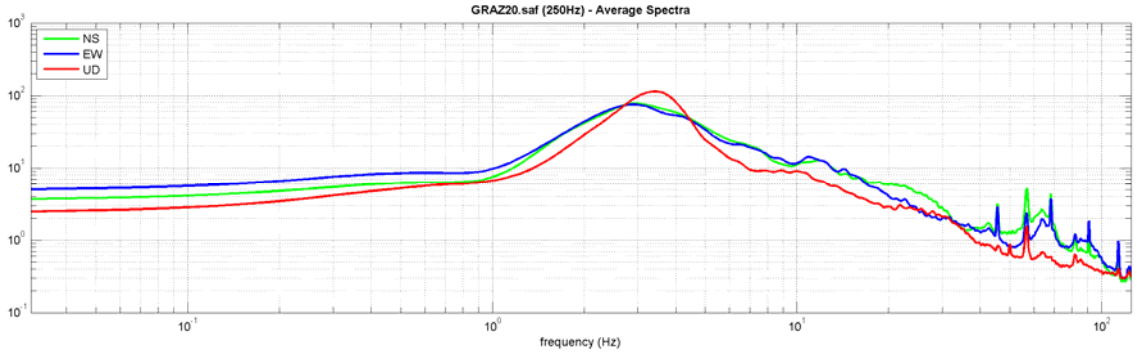
Dataset: GRAZ20.saf
Sampling frequency (Hz): 250
Window length (sec): 20
Length of analysed temporal sequence (min): 25.3
Tapering (%): 10
==========

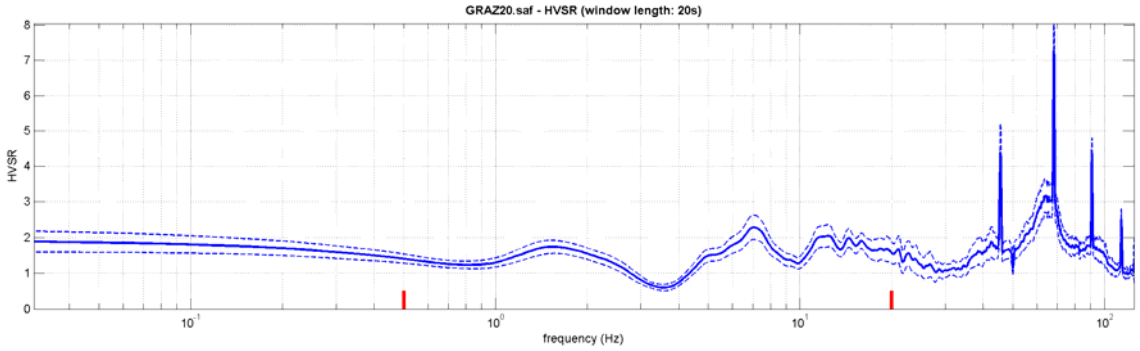
In the following the results considering the data in the 0.5-20.0Hz frequency range
Peak frequency (Hz): 1.5
Peak HVSR value: 2.3
Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 7.1 > 0.5 (OK)
#2. [nc > 200]: 21245 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)

Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========

#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: yes, at frequency 4.5Hz (OK)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: (NO)
#3. [A0 > 2]: 2.3 > 2 (OK)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 4.795 > 0.354 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.339 < 1.58 (OK)


selected traces
time (s)
0
200
400
600
800
1000
1200
1400
1600
1800
UD
NS
EW
components


GRAZ20.saf (250Hz) - Average Spectra
NS
EW
UD
frequency (Hz)


GRAZ20.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)